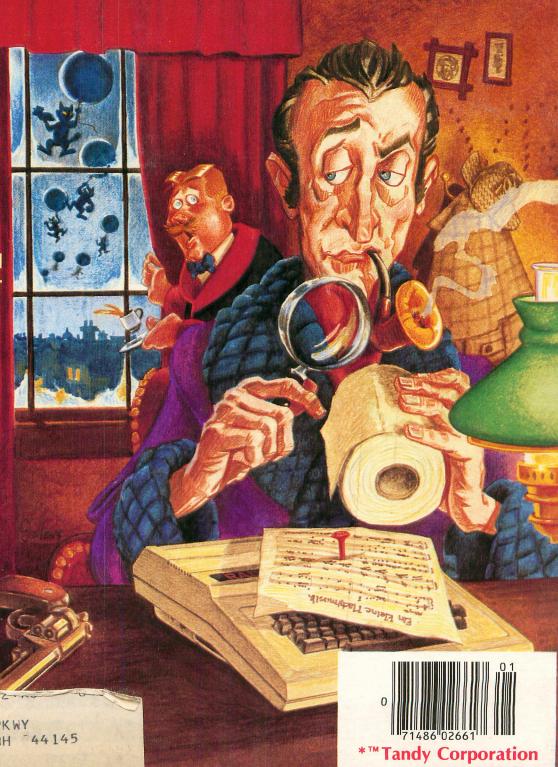
REVIEWED

- Dragon 64
- A Look at Compuserve
- Microneye Digital Camera
- HJL Keyboard
- Radio Shack Daisy Wheel Printer
- 15 DBMs Compared
- RDC Disk Controller
- Mozart Composer
- Words That Act

GAMES

- Time Patrol
- Fury
- Fire Copter
- Buzzard Bait
- Calixto Island
- Glaxxons
- Hyperzone
- Gin Champion
- Pooyan
- Wizard 64
- · Zeus
- Babylon
- **Starship Hercules**

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32K C \$21.95

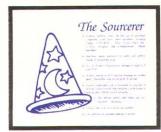
32K D \$24.95



Big league graphics! Two players against each other or one can practice offense against the computer. 7 defensive & 8 offensive plays plus many formations.

32K C \$26.95

32K D \$29.95



This menu driven symbolic 6809 disassembler produces symbolic source code that can be assembled. Automatic equate generation. FCC, FCB, & FDB generation. Written in position independent code, it is relocatable to any memory area. User defined symbol/label area. Produces files with or without line numbers. Can symbolize all extended addresses if desired. Written in assembly language for extreme speed. Disassemble to disk or cassette, printer, or screen.

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16K D \$39.95



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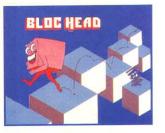
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32K D \$29.95



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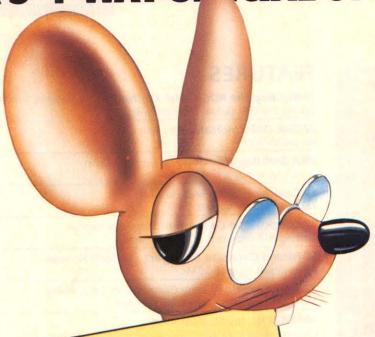
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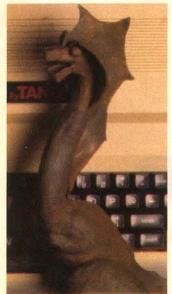


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(Review	26/A Grab Bag of Reviews by R.W. Odlin A look at a mixed bag.
(Utility	30/Cruncher by William Harris Take out space-wasters.
(Review	42/CompuServe Connection by Terry Kepner Getting the most out of CompuServe.
(Review	55/Fifteen Database Managers by Scott Norman An in-depth look at DBMs.
— (Review	81/The Dragon by Larry Cadman and Doug Kelley There's a new color computer in town!
(Utility	89/SEARCH! by Stephen Allen Locating data in ROM.
(Review	93/Digital View Camera by Howard Bassen Images through your computer.
(Utility	98/?REDO Remover by Richard Rutter Faster debugging.
(Education	102/Generic Tests by Robert Toscani Enter any topic — test on any topic.
(Education	108/Color Computing for Kids by Jean Plesser A review table, new commands, and games.
(Math	114/How to Remember Not to Forget by Norman Garrett Date conversions made easy.
(Home Management	117/File It by Keith Baker A DBM for your own use.
(Utility)	128/Stepper by David Jenkins One line at a time debugging.
(Utility)	132/Directory:XXX by Byron Palmer Keeping track of cassette tracks.

DEPARTMENTS

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11/INKEY\$

135/REVIEW\$

Games, printers, books, and more!

153/NEW:PRODUCT\$

158/END OF FILE

160/FOR...NEXT (02,84)

"But Holmes, what can it all mean?" by Jim Sollers

ABC membership applied for.

THE COLOR COMPUTER MAGAZINE is published monthly by New England Publications Inc., Highland Mill, Camden, ME 04843. Michael Perlis—President, H. John Delile—Vice President

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-PEEK (01,84).



ow that you all have received your holiday computing gifts, we expect you've already started a wish list for next December, and your birthday, and your next pay check, and... well, let's face it, we could go on and on buying more goodies.

Now, before you spend that nice \$50 check rich old Uncle Albert sent you, sit down and think carefully about what your computing needs really are, and what they'll be six months from now. And especially, read this issue carefully. A good review can give you a priceless insight into a variety of products that you just *know* you have to have, and let you choose the very best of all of them. Sit back with the remains of the mulled holiday cider or eggnog, prop your feet up on that brand-new printer carton, get out the spectacles, and read on:

Everyone needs a data base, at some point in time. Even kids have lots of "stuff" to keep track of. But there are so many DBM's on the market, where do you even start when you need to find one to suit your needs and wallet? GOTO 55 and read Scott Norman's comparison review of data base managers for the Color Computer.



CompuServe is a word we've all heard, a few have experienced, and more have wondered about. Whether you're a seasonal user, a curious initiate or just wondering, you should GOTO 42 to discover what CompuServe is, what it does, how to get on it, and especially, to pick up some shortcuts. Terry Kepner (our Defusr answer oracle will continue this introduction in a periodical column, full of hints and tricks—The CompuServe Connection.

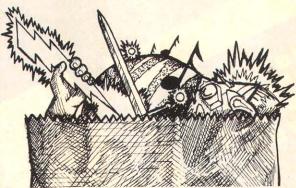


You only thought that Dragons are legendary beasts from medieval days. Well — The U.S. has recently had many Dragon sightings, and from all reports, the beast and the valiant knights who braved its den have prospered, sharing the Dragon's treasure. Doug Kelley and Larry Cadman, two of the early knights-errant, are willing to share some of the Dragon gold with us: GOTO 80 to discover what the Dragon is really about.



Disk controllers are necessary and expensive, but Gene Grunby would have us know there's a better way: build your own. GOTO 18, for Grunby's review of the RDC-1 disk controller.

Ever wished your Color Computer could do image processing? Who says it can't? GOTO 93 for a new view of what's possible, and a review of a neat peripheral — Digital Video Camera.



Games, adventures, keyboards, books, utilities, educational software, music, printers — you name it, we've got it. Check 'em out carefully: GOTO 27 and GOTO 134.

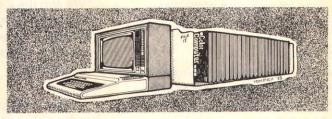
Now, some articles to help you use your holiday gifts bet-

First GOTO 108 for the next step in programming, via Jean Plesser's "Color Computing for Kids." Then GOTO 22 for directions for making a disk drive indicator, so you'll never leave your new drives on inadvertently.

GOTO 30 to learn how to pack your programs tightly; GOTO 89 to learn how to find routines in memory. To speed up debugging some always-recurring errors, GOTO 98.

Teachers with a new machine should GOTO 102 for a generic test program that will make you happy.

Need quick date conversions? GOTO 114.

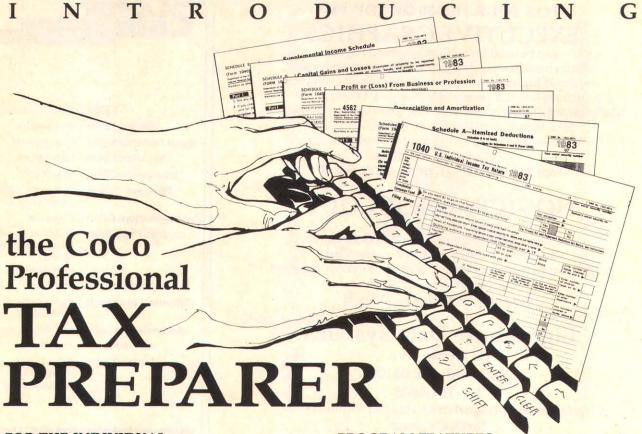


Oh, did we say data bases? Hey, you too can file it — GOTO 117. And if your program lists too quickly for you, you can step through it easily, if you GOTO 128.

Last, but not least, everyone needs a directory program. There's one here — GOTO 132.

We hope this issue helps you enjoy your new system to the full.

— D.M., Editor



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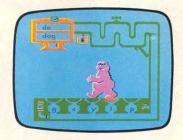
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The Color Computer Magazine **Highland Mill** Camden, ME 04843

when we began The Color Computer Magazine; should we also ignore the new Color Computer, The Dragon, and anything else that's a good innovation? Come on — the MC-10 is a Radio Shack Color Computer, and not incompatible with our old standby, as our authors have shown. Maybe you'll learn something from those articles.

- Ed.s.

August EOF — Piracy

Re: the August "End of File": the subject is very valid, and it is an issue that has been around for a while. I recall some discussions on that very subject at my place of former employ-

I think there are basically two ways to deal with the problem, if indeed you wish to label it a problem.

First, make it economically unfeasible to copy programs. One way is to price the software very low, and hope to make the profit in increased sales. Also, unless a buyer is registered, he won't have access to updates as they come available.

The second is to just recognize the problem, and charge for it. My former employer didn't have any security devices on their software, and I believe their policy was that software back-ups and copies were ok, as long as it stayed in the organization to which it was sold, and wasn't resold. A common complaint from customers was that the software was a bit expensive, for obvious reasons. And, as you might expect, the software was copyrighted.

This does have some advantages: you sell fewer copies, but you still maintain your profit margin from the higher markup. Also, your customer base is smaller, so you have a lower database to maintain for software updates. By the way, they did charge for software updates; I believe it was a reproduction charge.

Clayton Y. Wong, Honolulu, HI

NO MC-10

I must complain about the amount of space you have been devoting to the MC-10 computer. Look on the cover of the latest issue of your magazine: what does it say under the title? It says: for TRS-80 Color Computer and TDP-100 users. It does not say anything about the MC-10.

I did not subscribe to your magazine to read articles about a computer I do not own in a magazine for the computer I do own. Have you come to depend on authors such as Dennis Kitsz, William Barden and others so much that you print anything they send you regardless of the computer it is for?

> Lawrence Leonard Bristol, VA

Hum. The MC-10 wasn't out

Ex-Paker

Since keying in Robert Blake's program from the August issue, I have been using my Color Scripsit program about three times as much as I used to. I feel much better about using it, now that I don't have to plug in the Program Pak. Unfortunately, because I own a DMP-200 I can not take advantage of the wide printing feature, and the Color Scripsit program does not allow for implanting control codes. This means that I can't use printer features such as underlining, superscript, subscript, or wide printing. But, Mr. Blake's program did allow me to put away the Program Pak which I have never trusted, or liked using.

I would like to congratulate Mr. Blake for a great program. And I would also like to suggest that he write a program which would allow me to copy all my

Program Paks to tape — with or without changes. I own eight Program Paks and hardly ever use them for fear of ruining my Color Computer.

Charles M. MacLeod Taunton, MA

October EOF

In his "End of File" (October, 1983), Mr. Leichtman asks what readers think of the software rental business.

Software rental is little more than a camouflage for the gentlemanly art of theft. Everybody does it, and everybody knows that everybody does it.

Plagiarism is probably the third oldest profession, and there is probably no way to stop it. Pirated editions of Shakespeare's plays were very popular during the latter part of the sixteenth century and the early part of the seventeenth century.

Don't get me wrong; I have no software on the market at this time. I have no personal axe to grind. But theft is theft. Piracy is piracy.

Legislation is needed at the national level and at the statehouse level. The only equitable procedure that I can think of is to require all software renters to pay a royalty to the authors for every software rental. Plays, films, and music all operate on such a basis.

James S. Purcell Oxon Hill, MD

Bulletin Boards

Alaska BBS

Coco-Cold BBS, 4239-4599th Street, Fort Wainwright, Alaska 99703, phone: (907)ELO-COCO, Voice Line: (907)356-1834. Thank you, Kerry Clabaugh (same).

Washington, DC

CoCo-Time, 703-569-3716, Washington, D.C.; Sysop: Jeff Beckerman. Run with tape, not disk!!

Sarasota, FL

The Color-80 (Silicon Rainbow Products) BBS system is run on a TDP-100, operational 24 hrs a day at 300 baud. The number is (813)924-COCO. We support uploading, downloading of Color Computer programs, E-Mail, color pictures and much more.

Our club meets the second Saturday and last Thursday of each month. Call our BBS or 813-921-7510 for more

DBM Error

A small omission in Line 6110 of Paul Detwiler's useful DBM program published in your premier issue causes the BS error in Line 6140 when performing field sorts. Line 6110 should read: FOR Z=1 TO Q-1.

> Ralph Berger Santa Cruz, CA

More DBM

For those having trouble with the DBM program found in March issue; change the M variable in Lines 6560, 6570,

6580 to some other letter. T works. M is the variable used in the DIM statement.

Our update to this program offers eight choices in the second menu; the original, plus number 5 — change data, number 7 — add data to file, number 8 — (a modified version of the) overlay update file (found in the September issue, pg. 10.) This program requires 32K, Extended not needed.

J. Chamberlain

Software Rental

The software piracy issue will probably occupy more printed

pages and raise more questions over the next few months than any single item since the introduction of the computer. 'Way back when Owls Nest Software was in the planning stages, we considered the problem very carefully. This was, of course, before the software rental houses become a reality.

Our feeling at that time was that while software piracy was indeed a problem, the main concern should be the paying customer. We felt an occasional situation where two or three people split the cost of a program might, at times, actually result in an extra sale. We decided that a legitimate buyer

of our programs was entitled to every benefit he or she expected, including the ability to make back-up copies.

As a result of that feeling, we adopted a firm policy of providing back-up instructions with every program we sell. That policy is still in effect today. It is, however, becoming more and more difficult to justify as correct. Yes - we feel the original customer has every right to a back-up, but our company has rights too. As both a consumer and producer I can wear two hats. I still feel our original decision was correct and we will continue to provide backup information.

We maintain a record of all

original purchasers of our software. If a question or request arrives from a name we can't match we insist on proof that the person does indeed possess an original copy of our program.

The rental question will become the big one. It may drive many software houses out of business and prevent many more from going into business. This is a shame because it will lower the quality and selection of good software while raising the price. The irony of the situation is that the rental houses will be biting the hand that feeds them. They will be starving their source of supply.

If a rental house is sincere.

Clubs

Raleigh Club

The Raleigh, North Carolina Color Computer Club has over eighty members. We meet at 7:30 p.m. on the second and fourth Wednesdays. There are no dues yet, but the need for a newsletter may prompt us to institute a small fee in the future. Newcomers are always welcome. Contact: David Roper, P.O. Box 681, Garner, N.C. 27529.

Northwest Florida

The Northwest Florida Coco-Nuts (Color Computer Users' Group) meets on the first and third Fridays of every month at 7:30 p.m. in Fort Walton Beach, Florida. For more information contact: Bill Lamb (904)244-5281 or Jim Waits (904)837-6538.

Lincoln, NB

The first Color Computer Users' Group of Lincoln, Nebraska meets the third Saturday of every month between 12:00 and 2:00 in the afternoon. Membership to the club is free of charge and we do publish a monthly newsletter. Contact: Bruce Gregg, RR #1,,Box #139, Hickman, NE 68372; telephone: (402)788-2563 or (402)475-5517.

San Bernardino/Riverside

A new Color Computer Users' club for San Bernardino/Riverside and vicinity, the Citrus Color Computer Club (CCCC or 4C's) invites those with TRS-80 Color Computers, TDP-100s, and Dragons to join our membership. Individual membership fees are \$12 for 1 year and family membership fees are \$20 for 1 year. For more information, please contact: Citrus Color Computer Club, C/O Personal Relations Chairman, 18227 Muriel Avenue, San Bernardino, CA 92407.

Spokane

Anyone interested in more information about the Northwest Computer Club can call Tim Watson at (509)928-5883 or Terry Thompson at (509)489-5133, or write to Judy Gehman, E. 14012 Cataldo, Spokane, WA 99216.

Calgary, Alberta

Our meetings will be held at 7:30 (p.m.), on the first

Wednesday of each month at the Queen Elizabeth High School, 512-18 Street N.W., Calgary, Alberta. Everybody is welcome! We would also like to establish inter-club activity by inviting other clubs, or members, to write about specific problems they have been at odds with. We will present these letters at our regular meetings, and if one of our members has a possible fix, they will be assigned as respondant. We are looking forward to hearing from all you 6809'ers out there! Contact: David A. Logan, Public Relations, P.O. Box 453, Trochu, Alberta, Canada TOM-2CO.

Dayton

For information about the Dayton Coco Users' Group, contact: Joe Evans, 609 Applehill Dr., West Carrollton, OH 45449.

Athens, GA

Anyone in the Athens, Georgia area who is interested in visiting or joining a Color Computer club: a group meets the first and third Tuesday at 7:30 p.m. in room 381 of the Science Library at the University of Georgia. If you need more information write to Rt. 2, Box 165-A, Watkinsville, GA, or simply come to the meetings.

Wichita, KS

The Color Computer Club of Wichita meets at 7 p.m. on the last Thursday of each month at Rivco, 1205 N. Mosley, Wichita, KS 67214. Anyone wishing more information can contact our president: Rex Rivers, 1205 N. Mosley, Wichita, KS 67214.

North Carolina

If you are interested in starting a Color Computer Users' Group in the Fayetteville, NC area, please contact Rich and Noel DeLuna, 5501 Crestview Place, Spring Lake, NC 28390.

Evansville, IN

Anyone interested in forming a C-C Club in the Evansville, IL area should contact Brian Brogles, Box 462, Poseyville, IN, 47633: telephone (812)874-2210.

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--INKEY\$

they might request special protected versions of the programs they rent. If the customer decides to purchase he could be provided with a non-protected copy. This will not happen to any degree because I believe the main reason the product is rented is to copy it, not test it. The rental houses know full well if they used protected software they would soon be out of business.

Laws will be written and they will be broken. There is not a clear and easy solution. The pity is we all lose. First the author, who loses his royalty. Next the software house, which loses the sale, and finally the consumer, who has less selection of more expensive software to choose from.

Norman R. Shelton President Owls Nest Software Ooltewah, TN

More Bytes

The 32K Color Computer indicates 24871 bytes of available memory after turning the machine on and typing: ? MEM. By typing PCLEAR 1, the command ?MEM results in 29479 bytes. The difference is obtained from Graphic Screen Memory pages 2, 3 and 4.

Here is a short procedure to obtain 31015 bytes, provided the intended program contains no graphics: Type ?MEM Enter; Type PCLEAR 1 Enter; Type POKE 25,6 Enter; Type POKE 1536,0 Enter; Type NEW Enter; Type ?MEM Enter.

The POKE and New commands make the 1536 bytes of Graphic Screen Memory page 1 available for a total of 31015 bytes.

Dr. Konrad H. Kossman Columbus, OH

OS-9/Flex

Dr. Pass's article comparing and contrasting OS-9 and Flex (September, 1983) was interesting and informative; however, there are some aspects of it that deserve comment. Some details, most notably

the low price and bundling of the editor and assembler with the operating system, differ between Color Computer and non-Color Computer versions of OS-9. This, however, requires the use of 20/20 hindsight not available to you at the time the article was written or the September issue put together. In any case, I hope that readers read the advertisements and do not get a misleading impression of the relative prices of Color Computer OS-9 and Color Computer Flex.

Other points, however, are not time-dependent (so far):

- 1. The character separating commands that form part of a pipe is an exclamation point, not caret.
- 2. Requiring position-independent (and even reentrant) code is hardly a limitation on the 6809. The 6809 was designed to make such code easy to write. OS-9 takes advantage of that to provide the facilities it does, while Flex, a retread of a 6800 operating system, does not.
- 3. It is not at all clear that Flex is easier to use than OS-9. To give two examples: being

able to specify wild cards in file names is often considered dangerous and user-unfriendly by experts in human factors. (See Donald Norman's paper "The Trouble With Unix." I don't hold this to be an undesirable facility, just an example that ease of use is not an obvious thing. Let's see, how do you change default drives in Flex? ASN something or other...) Also, OS-9's multitasking facilities can be used in well- designed programs (such as Basic09 and the editor are) to let the user escape into the shell temporarily, avoiding some of the troubles associated with "modes" in computing systems.

4. How many users are concerned about the ease of debugging assembly language programs? It would seem far more important to be able to debug Basic programs easily, and Basic09's debugging capabilities are the equal of any I've had access to. There are better, but then nobody has implemented INTERLISP, Smalltalk, or CLU on a 6809 yet.

5. Dr. Pass correctly describes Basic09 floating-point numbers

as using roughly nine significant decimal digits; however, there is an inconsistency in his reporting of bits used. Each significant decimal digit requires about 3.3 significant bits, and sure enough, Basic09 uses 32 bits of a five-byte (40 bit) value for mantissa.

The cited 17 significant decimal digits for Flex's Basic, though, would require all 56 bits Dr. Pass describes as used. I can only conclude that he has omitted the size of the exponent from his calculations for the size of floating-point numbers for Flex's Basic. This means that Flex Basic must use at least eight bytes for each floating-point value.

Whether this is worthwhile or a problem is something for each user to decide, and indeed will change for a given problem. I should point out, though, that if one is truly interested in business applications, one wants decimal arithmetic. Does Flex Basic use BCD internally? I think not, given Dr. Pass's description, as it would then need 68 bits for 17 BCD digits (not counting the exponent).

I should also point out that Cobol, for which a great many business-oriented programs indeed exist, is available for OS-

6. It would seem that good I/O facilities are at least as important for business applications as decimal arithmetic. I cannot vouch for Flex Basic's abilities in this area, but I can state that BasicO9's are quite good. I can also state that BasicO9 provides reasonable control and data structures. If Flex's Basic does so, I have yet to see them. (They aren't there. Thanks to Wayne McGee for his article "A Tale of Three Basics," in the June, 1983 System 68 magazine.)

I shall not go into other details of Basic09, Pascal, or C as they run on OS-9, but in summary I shall state that I disagree strongly wth Dr. Pass's contention that Flex is easier to use than OS-9, and while I would have to agree that OS-9 is easy to write new device drivers for, that is far from the only reason to choose OS-9 over Flex.

James E. Jones Norman, OK

---Fix (10,83)

Custom Color Fix

Those who make Dennis Kitsz's 64K upgrade (October, 1983) for Revision D boards should make these changes to the instructions:

In Step 5 change *trace 2* to *trace 3*.

In Step 6 change trace 3 to trace 2.

In Step 8 change trace number 2 to trace number 3.

In Step 9 change trace number 2 to trace number 3.

In Step 10 change *U35 pin 10* to *U10 pin 35*.

In Step 21 change C63 to C61.

---Fix (11,83)-

Sorcerer's Fix

Please note that in the Sorcerer's Puzzles (November, 1983, page 34) Programs 1 and 2 (Vortex and Jump Away Solitaire) will run in 4K Color Basic. Programs 3 and 4 (Flat Cubes and Logicolor) require 16K Extended Color Basic.

Slither Fix

The Slither Basic listing on page 47 (November, 1983) is missing Line 10: GOTO 4000.

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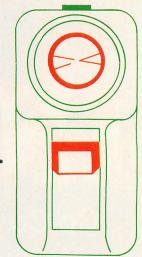
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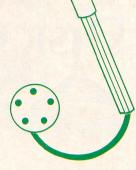
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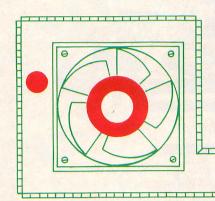


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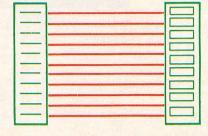
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Building the RDC-1 Disk Controller



A review!



by Eugene I. Grunby

THE RDC-1 IS a printed circuit board functionally equivalent to the Radio Shack Disk Controller for the Color Computer. This product should be of interest to owners of the Color Computer. It provides a less expensive alternative to the Radio Shack controller and offers more features.

Because the RDC-1 is not actually a kit, the purchaser will be shopping for the few necessary electronic components before assembling the controller. The marketing firm, F & D Associates, simplifies the builder's task by including the SMC9216B data separator chip with the circuit board. The floppy disk controller chip (FDC 1793), the Radio Shack Disk Extended Basic ROM, and a plastic cartridge case are available at extra cost. As options, the board designer has permitted substitution of one of several ROMs in place of the Disk Extended Basic chip; this feature allows the controller board to accommodate custom firmware. The RDC-1 is an honest product and should receive serious consideration by anyone who can solder and has a basic understanding of circuit diagrams.

Why Build?

Assembled Radio Shack Disk Control-

lers are readily obtainable, so why build a controller? The reasons for each builder are individual. Often, a modest out-of-pocket cost savings can be realized; there is a personal sense of accomplishment and ownership; through the process of construction an understanding of the product is gained and may be useful for maintenance; and finally, the additional features and virtues of the product may make it more attractive than the unit it emulates.

Required Skills

With common sense and some insight, a person who has previously built electronic kits can successfully complete this project. The RDC-1 requires a moderate amount of assembly experience. However, only an experienced person with some electronic background will be able to diagnose problems due to faulty components. Novices should beware and not attempt construction! There is no warranty or repair service for the final product. For the inexperienced builder, the vendor has indicated to this reviewer that assembly service can be obtained for about \$25. If the purchaser finds that this project demands more than expected, the circuit board and documentation can be returned for an immediate refund.

Product Description

The RDC-1 printed circuit board shows sensible planning and sufficient attention to quality. The board is glass epoxy and has tracings on both surfaces. Board topography is logical and simple. The two card-edge connector surfaces are tinned, rather than bearing gold inlays in deference to cost. Although the cardedge to be inserted into the computer cartridge port omits two extra ground connections, they are not essential. These ground paths were meant to reduce TV interference but were not very effective. The numerous configuration options and features are described in a later section.

By virtue of the data separator chip that is supplied with the board, no calibration or adjustment of the circuits is required. Performance problems due to alignment errors or drift should not occur.

A photocopy of the User's Manual is provided. The manual clearly states that it was written recently and may have a few errors or omissions. Except for a few problems mentioned later, the manual withstood the test of use. However, only a bare minimum of information is available. The sections of the manual are titled: "Description," "Ordering Parts," "Options," "Sample EPROM/ROM Configurations," "Assembly, Drives, and Cable." Also included are a parts list, reproduction of the component side of the unpopulated circuit board, picture of chip locations, and schematic of the circuit

An optional plastic case was obtained from the vendor to give the controller a finished look. The case is the customary enclosure used to house the standard Radio Shack controller.

Obtaining Parts

The RDC-1 must be populated with components obtained by the purchaser from other sources. F & D Associates sells the floppy disk controller chip, the Disk Extended Basic ROM, and the plastic case to simplify the purchaser's task. All other components — resistors, capacitors, sockets, jumpers, crystal, and other integrated circuits — are available from electronic parts outlets. The cost of these parts was above the minimum required to make a mail order, so I elected to buy from a mail-order house. Not all parts were in stock. I had to shop around for the remaining parts because the remaining cost did not meet the minimum order threshold.

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Cost

Table 1 summarizes the typical cost of an assembled disk controller. The cost as listed presumes that the builder already owns the Extended Basic ROM. This ROM is a prerequisite to upgrading to the disk operating system. (It is different from the Disk Extended Basic ROM, which performs disk I/O). Use of a blank "disk" ROM for special applications would reduce the total cost by as much as \$27 but would not allow use of the Radio Shack disk I/O routines. Use of an assembly service would add about \$25 to the cost.

The reader may observe that the total cost is less than the cost of an assembled, discounted Radio Shack disk controller—currently sold for about \$180.

Parts List

COST

ITEM

49.50 RDC-1 board, manual, and SMC9216B

30.00 FDC1793 controller chip

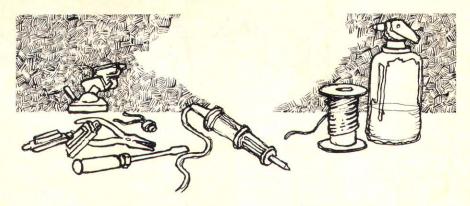
35.00 Disk Extended Basic ROM

7.50 plastic case

16.00 additional components

3.00 shipping and handling

141.00 TOTAL COST



Options and Assembly

Before assembling the RDC-1, the builder must decide what board options will be used. The RDC-1 allows considerable flexibility in the selection of the disk ROM to be used. Choices are a 2716, 2532, 2732, MCM68764, 2764, or 27128. You must also choose among controller chips: an FDC1797 controller chip with side select and four drives, an FDC1793 with four drives and no side select, or an FDC1793 with three drives that uses the fourth drive select line as a side select line. Options are installed by cutting traces or soldering jumpers. The board is initially configured for full compatibility with the Radio Shack product, that is, an FDC 1793 with four drives.

Assembly time by the reviewer was under three hours. This included time to investigate unclear component locations. Herein lies a weakness in the documentation: the manual is actually a 1 to 1 photocopy scale reproduction of the component side of the board. Clarity is low. Locating parts is accomplished by visual pattern matching. There are no lithographed symbols on the board. The small size of traces and solder points on the photocopy requires careful concentration. In some cases there is a need to correlate locations with the schematic diagram.

The reviewer strongly recommends using IC sockets. It is best to install the sockets before any of the bypass capacitors are in place, otherwise, space con-

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flicts may occur. Only one other special precaution is suggested: because there is no diagram of the solder side of the printed circuit board, the builder should study the location of each tracing bridge before soldering a component. Once a component is installed, differentiating an erroneous bridge from an intended bridge is very difficult. The remaining assembly process is simple.

Recommendations

The suggestions listed below were sent to F & D Associates for comment. Their response may be found in the last section of this review.

- 1. To reduce confusion, change the reference to "install the electrolytic capacitor" to "install the tantalum capacitor."
- 2. Add the tantalum capacitor to the schematic diagram.
- 3. Provide a diagram of the foil side of the printed circuit board. Include a shadow image of the components. This will help to identify intended solder bridges and to allow a check for component placement.
- 4. Correct the placement of the disk capacitor near the 7406 in the center of

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the board. It should be connected to the tracing next to Pin 14, not at Pin 14.

- 5. Improve the quality of reproduction of the manual.
- 6. Installation instructions should suggest that IC sockets should be soldered before disk capacitors.
- 7. Description of the wiring option for J11 is in error. The corrected text should read: "J10 should be installed. J9 should not be."
- 8. Allow the purchaser the option to buy gold contacts for the edge connector pins. Gold overlays, such as El-Fab's Finger-Pac (tm), are a suitable choice as they may be soldered over the existing tinned contacts.

Conclusions

I rank the RDC-1 "fair" for the assembly process because of minimal instructions and poor pictorials. (It is expected that the vendor will take note of these deficiencies and correct them by the time you read this article.) However, in terms of performance, the RDC-1 receives the rank of "highest marks." I have used the RDC-1 with the Flex operating system and with the Radio Shack Disk Operating System. It functions perfectly with single density, double density, and double-sided disk.

Ordering the RDC-1

The disk controller board and critical parts may be purchased from: F & D Associates, 1210 Todd Road, New Plymouth, OH 45653. Inquiries may be directed to Dave Weeks at (614)592-5721.

Response From the Vendor

Comments about this article were solicited from Mr. Weeks in the hopes that a written response would be of general benefit. These hopes have been realized. The following reply from Mr. Weeks is presented without abridgment or editing:

ing:
"Mr. Grunby has some good points—
we are correcting and improving the documentation where necessary.

"A fairly large number of these boards have been sold and we have many reports of successful assembly and operation. All the comments have been positive so far. Only one person has reported that the board did not work on the first try. Even though we solicit comments on the documentation package, Mr. Grunby is the first to offer any.

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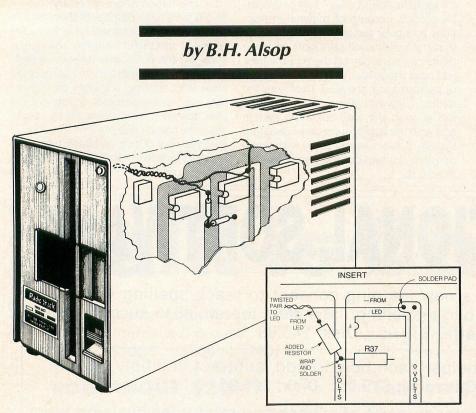


Figure 1. PC board close-up and insert for on/off light modification.

HY DIDN'T RADIO SHACK include an on/off light on the Color Computer disk drive? They should have; I've left mine on overnight too often. Fortunately, some very minor surgery can cure this shortcoming. In fact, for less than \$1 and 30 minutes of your time, you can add a simple on/off indicator.

When I opened the drive and surveyed the situation, I was led to one conclusion: If I wanted to add an indicator, I'd have to drill a hole in the front panel. Stop reading now if you don't want to take that step.

Case Removal and Preparation

First unplug the disk drive cables and unscrew the four cross-head screws on the outside of the case. Position the drive in front of you in its upright position, pointing the front of the drive to the left. Now compare the printed circuit board

to Figure 1: Locate TP1, integrated circuits 1,3,4 and 10. The IC labels are stamped on the PC board without the usual U suffix. Locate R37, and the zero and five-volt buses, also labeled on the PC board. Locate the solder pad to the upper right of IC 4. Look now at the upper inside corner of the disk drive front panel; there is a rectangular boxed area which is where the LED indicator will be installed.

The only parts required are a resistor and an LED. Since I didn't want to drill a large hole, I settled for a miniature red LED like Radio Shack's part number 276-026. You can choose whatever suits your fancy; there are even LED's that blink automatically. However, choose a current-limiting resistor to match. Choose its value using this formula:

R=3000/I where: R=the resistance in ohms I=the LED current in milliamps

The numerator value is 1000*(5 volt supply LED voltage drop). For an LED requiring 20 milliamps, the required resistance value is 150 ohms. A half-watt resistor has large enough heat dissipation for this application.

Installation

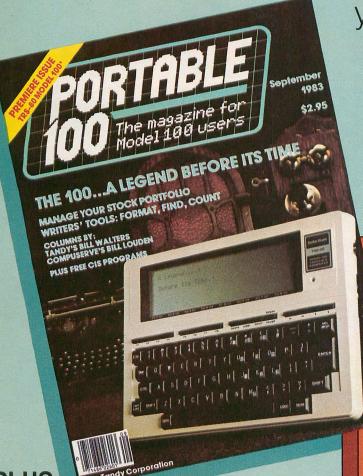
Refer to Figure 1 and its insert, and determine the size mounting hole required. Place a piece of tape over the rectangular box behind where the hole is to be drilled; this will keep drill chads out of your drive. Twist a pair of 8 inch wire lengths together, and solder one to each side of the LED. Refer to the LED package to determine the plus side of the LED, then label the plus wire. Drill the hole, remove the tape and insert the LED. Tape the LED leads to prevent shorts.

Refer to the Figure 1 insert again. Solder the current-limiting resistor to R37 where R37 enters the 5 volt bus, using a short lead. Solder the positive lead from the LED to the other end of this current-limiting resistor. Solder the remaining wire to the solder pad as shown. Dress the twisted pair as shown and secure it with tape. Make sure the current-limiting resistor does not touch any other electrical connections.

To test the indicator, plug in the disk drive with the on/off switch off. Check the wiring again and if all is well, turn on the drive. The LED should light up. If not, recheck the wiring. If the wiring is correct, try reversing the leads to the LED. This should fix the problem. Unplug the drive, replace the case and hook the drive to the computer.

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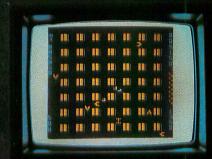
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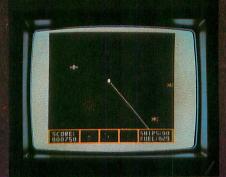
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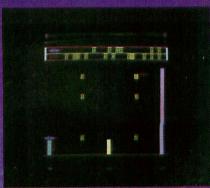
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by R.W. Odlin

Software Round-up

After the stimulating experience of frying my motherboard, I start this piece with eight shiny new 64K chips on a board explicitly labelled "64K" — Telewriter-64 now tells me the memory buffer contains 36K — and a 90-day wait before I can put the good keyboard back in. Fortunately, none of these programs calls for any heavy-duty typing. (One of

them is no program at all, but a joystick enhancement.) Let us take them alphabetically:

AREX

Adventure International P.O. Box 3435 Longwood, FL 32750 16K **\$34.95 cassette**

A REX IS THE MOST flossily-packaged of the programs under review, with a molded plastic folder and an expensively-printed manual (far too full of capital letters and exclamation marks, though) with clear and explicit instructions. It offers extreme difficulty in a variation on the Worm-type games which

were popular a year or so back. All sorts of things are bounding about the screen about to get you, and you are trying to secure as much of the screen as you can by extruding a wall behind you. It is quite ingeniously written, but its graphics are not very pleasant (on my set-up, the display kept flickering between color and black and white, but this may not be the program's fault).

The user has a choice of joysticks or keyboard (the joystick offers a slightly swifter response, it may be). If you halt for more than five seconds, a Rippler, or "lit-fuse" effect, eats up your back-trail. When it reaches your ship, the Rippler destroys it. Higher-level screens contain various obstacle patterns distinguished from your wall by their color, and these make it more difficult to safely fill the

On first loading I thought the main side of the cassette was blank, and found the back-up on the flip side impossible to load. It turns out that the copy on side one is at least five minutes into the tape. Since the program employs no protection schemes, it is quite easy to put a new copy nearer the beginning of the tape.

Babylon

Valhaíla Enterprises P.O. Box 243 Sumner, WA 98290 16K Non-Extended Basic cassette

THIS GAME IS A DISGUISED arithmetic-drill, but the disguise is remarkably pleasant. The supposition is that you are king of a small Babylonian town, trying to balance food supplies, defenses and population. The monthly progress reports are couched in a kind of cheery sarcasm which is very nearly irresistible over the short haul.

There are no graphics in this game, but it is not quite an adventure either, as these categories are understood. The user must be familiar enough with mathematical operations to enjoy such games as Monopoly before he will get much out of this one.

There is one small irritation: although the grain supplies are measured in bushels and the land in acres, the approach of the enemy is stated in kilometers. This draws unwelcome attention to the question of weights and measures, which we took for granted up to that point. I do not know what system was used in Babylon (shekels and such-like things, more than likely), but whatever it was, it was not to the base ten — the chances are the base was 360, as in the

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compass we inherit from their Master Mariners — and to introduce a conflicting convention in the midst of the game is to partially destroy the sort of semi-belief we lend these games while they are in progress.

Beyond The Cimeeon Moon

ColorQuest, a division of Softlaw 9072 Lyndale Avenue So. Minneapolis, MN 55429 16K ML, keyboard only \$24.95 cassette \$29.95 32K disk

HIS GAME IS BILLED as a seguel to "Adventure Trilogy," and shares with that trilogy an extreme and unrelenting difficulty for all but the hardestcore game enthusiasts.

You are trying to amass weapons and shields to secure your freedom from an alien space ship on which you have been imprisoned. The ship is booby-trapped at every turn, and nothing is easily identified: for instance, the first two objects you are likely to encounter are a shield belt (TAKE it and WEAR it) and a mauler rifle (TAKE it and HOLD it).

It must be an open secret that review copies come with a "cheat sheet" in the form of a map of the ship with all the useful objects labelled and located. Even that is not much help against the random patrols and one-way doors with which the vessel is infested. I have gone almost nowhere and seen almost nothing in several hours of play. Once killed you start all over. I started all over a lot.

I really like the graphic convention invented for this series of games or adventures (a further example is the recentlyreleased "Fembots' Revenge"), but it has one short-coming: keyboard entry of commands shows up on the screen with a noticeable delay — a delay long enough to occasionally get me killed.

There are two error messages: UN-KNOWN COMMAND, which means just that, and OOPIE!, which means you have entered a valid command in the wrong situation. Neither helps much in your quest for freedom, but then if the door was shown to you outright there wouldn't be much fun in escaping, would there? It should be mentioned, however, that the loading instructions are wrong. They tell you to type LOADM, which will get you nowhere. A look at the directory reveals that LOADM"WORLD should be typed (it

The above may suggest that the game is impossible to win. My 14-year-old came home from his grandmother's, spent two hours getting killed again and again to find all the things he would need

(and identify certain crucial mistakes on the "cheat sheet"), and then started anew and escaped in one minute fortyfour seconds (the program keeps track). He will be allowed out of his room in December, 1989.

Musical Lights

Zeta Software P.O. Box 3522 Greenville, SC 29608 \$7.954K cassette, \$14.95 16K cassette

HIS PRODUCT IS much more interesting than you would first suppose. All it does is present a sort of light-show, a screenful of graphics changing in time to what it hears from your cassette deck. The fascination is that you have total control, by one-stroke keyboard commands, over the elements of the display, and (at least in the 16K version) it implements all the semi-graphic modes the Color Computer has to offer. The sound you hear is as good as your TV allows, too, and that is a pleasant surprise, because it might have been filtered through the Color Computer's circuitry and come out as shaggy as most computer "music."

The commands let you toggle between monochrome (M) or color display, change the character (c) code displayed, take a faster (F) or slower (s) sampling rate, pause (P) and unpause (P); 0 gives you semigraphics 4, 1 semigraphics 6, 7 PMODE 1, 8 PMODE 3, and so forth. The background color changes in response to another command. You can single-step through the display or stop to print the screen on a line printer. Total flexibility: the commands listed here are merely a sampling.

Spectrum Starblaster

Spectrum Projects 93-15 86th Drive Woodhaven, NY 11421 \$14.95

HIS IS THE ONLY hardware item up for review, and it is such a small one I thought we might include it without offense. It really does what it claims: turns the firing button on your joystick into a rapid-fire button. It plugs into the joystick socket on the computer, and the joystick in turn is plugged into it. In appearance it is a small box with a dial on top; by turning the dial you set the speed of your repeat shots. But it may be less useful than it might seem, because half the trick of most games in which it is useful involves evading things fired at you.

Starship Hercules

Aardvark Ltd. 2352 S. Commerce Walled Lake, MI 48088 \$24.95 Cassette, \$29.95 disk, 32K

HIS IS A BIG slow Star Trek variant, and if you like this sort of thing, this is the sort of thing you will like. Even with 32K to spread out in, it requires user entry of the PCLEARO POKE before loading (POKE25,6:NEW).

The program features a "view-port" type display of the scene of action, and several auxiliary screens of data, maps and read-outs. The premise is that your massive starship Hercules has been sent to the interstellar buffer zone to intercept a fleet of Zargon battle cruisers. The buffer zone consists of 16 major regions, each subdivided into four quadrants. There are 25 mobile starbases. Your ship is fitted out with shields, phasers, photon torpedoes, a library computer, and all the rest of the expected paraphernalia. You can see why I called it big, and since it keeps track of all this from Basic it is even slower than you might suppose. The manual covers 30 pages.

Zeus

Aardvark Ltd. 2352 S. Commerce Walled Lake, MI 48088 16K ML, Joysticks only \$19.95 cassette \$29.95 disk

HAT FOLLOWS IS THE unaided effort of my eleven-year old, a more sympathetic description than I could achieve:

"If you thought fooling with Mother Nature was fun, then try fooling with Zeus. Zeus (for untold reasons) is mad at you. You (the mighty sorcerer) must use your magic staff to shoot the angry god's lightning bolts. The staff, however, must occasionally rest to build up power. You also have a shield that can save you if a lightning bolt gets on the same level as you. If you're looking for a hard, machine language game with high-res graphics and excellent sound effects, this is it."

At higher levels of play the very clouds shoot lightning, but neither of my sons has risen above level 13 yet, and what further surprises may be in store remain undisclosed.

The program is copy-protected at both ends, with an auto-start module at one end and a booby-trapped Reset key at the other.



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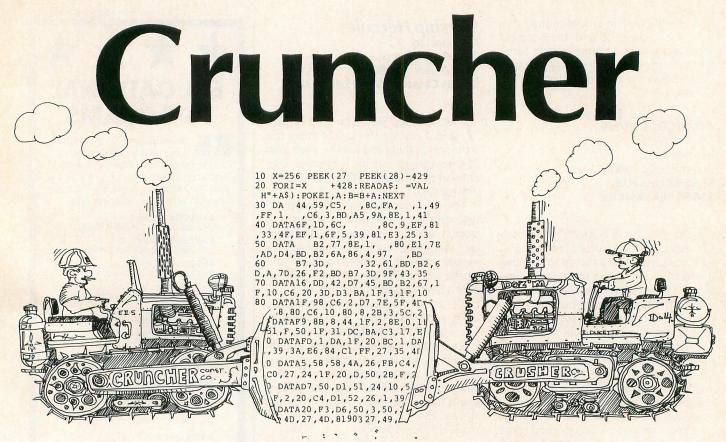
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Wouldn't it be nice to have a program that automatically gets rid of extra spaces, remarks, and extra letters in variables?

E OFTEN WISH that we could have the best of two worlds. Computer people are no different—dreams of programs that are easy to write, debug, and understand, yet are fast, efficient, and compact always seem to crowd our thoughts. I decided to investigate what I could do to improve the situation for the Color Computer...

Enter Program Listing 1. When I ran this program on my Color Computer, TIMER was 520. The available memory was 24703.

Now, run this program:

- 10 TIMER = 0
- 20 FORI= 1TO1000
- 70 NEXTI
- 80 PRINT"MEM = "MEM"TIMER = "TIMER
- 90 END

This should produce a rather large change in execution time. My computer produced a value for TIMER of 120! The second value for MEM was 24800, a reduction in size of 93 bytes, or over half the memory used by the original program.

If you suspect this program is not a fair example of speeding up and reducing a Basic program's memory use, you are

by William Harris





Extended Basic

right. I wrote this program to specifically illustrate something, and its only purpose is shock value. Obviously, I took out all the REMs and changed VARIABLE to I. Perhaps less obviously, I took out all the spaces.

What Basic Is

Basic usually comes with the computer you own. The Color Computer comes equipped with Color Basic, Extended Color Basic, or Disk Basic. Basic is an easy language to learn. Basic is a forgiving language. If you do something wrong, it will tell you in no uncertain terms. Basic is also fairly easy to debug.

Basic is an interpreted language. An interpreter is a program that acts as an intermediary between you and your computer. The Basic interpreter takes a Basic command and determines what should be done and how to do it. Interpreted language has advantages and disadvantages. Basic has one overwhelming disadvantage: It is slow.

What I Did

To speed Basic up, I took some of the work away from it. Look at Line 20. Certainly no one would use a name like ANYVARIABLE for a variable name. Replacing this name with I saves Basic the task of wading through 11 characters each time through the loop.

I also deleted REM statements. Every time you use a remark, Basic has to look at it and then decide to ignore it. If you delete the remarks, you can reduce memory requirements by almost half!

Likewise, extra spaces in the program waste memory and take more time for execution than is necessary.

Countless computer magazines give you 10 pages of programs containing lines like:

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This particular line would be terrible to debug. In fact, it contains a syntax error that may take you a few minutes to find. It would be so much easier if the data wasn't smashed together.

Your program will be virtually impossible to maintain if you have written it effi-

ciently, but if you write it so you can read it, your program will be hopelessly inefficient. One uncomfortable solution would be to save one copy to work on, and another copy without the remarks and spaces to run.

The Space Cruncher

The eagle-eyed among you have already spotted the assembly language listing. Type in the Basic loader preceding the assembly language listing and run it. Then whenever you have a program you want to shorten or speed up, CLOAD your program, and then CLOADM and EXEC the machine language program the loader has created. It will automatically get rid of extra spaces, remarks, and extra letters in variables.

If a remark line is deleted by this program, any GOTOs in the Basic program originally directed to a now deleted line will produce a ?UL ERROR. The problem is easily resolved in one of two ways: Write your Basic program so you never GOTO REMs, or edit the GOTO so the program goes to the next line.

Program Listing 1. Sample Program

- 10 TIMER=0
- 20 FOR ANYVARIABLE=1 TO 1000
- 30 REM
- 40 REM THIS LOOP DOES NOTHING
- 50 REM IT IS JUST A SAMPLE LOOP
- 60 REM
- 70 NEXT ANYVARIABLE
- 80 PRINT "MEM="; MEM; " TIMER="; TI MER
- 90 END

Program Listing 2. Basic Loader

- 10 S=PEEK(116) * 256+PEEK(117)
- 20 S=S-427
- 30 CLEAR 4,S-1:RUN40
- 40 S=PEEK(116)*256+PEEK(117)
- 50 S=S-427
- 60 C=0
- 70 FORI=0TO427
- 80 READ A
- 90 POKE S+I,A
- 100 C=C+A
- 110 NEXT I
- 120 IF C<>42377 THENPRINT YOUR D ATA STATEMENTS ARE IN

PLEASE RECHECK THEM. ": END

130 PRINT"PUT THE TAPE YOU WISH

TO SAVE XCMP ON IN YOUR TAPE R

PRESS PLAY AND RECORD ECORDER.

PRESS <ENTER> WHEN YOU

READY TO CONTINUE"

ARE 140 IFINKEY\$<>CHR\$(13)THEN140

150 PRINT"SAVING MACHINE LANGUAG E PROGRAM XCMP":PRINT"START ADDR "S:PRINT"END ADDRESS:

+427: PRINT"EXECUTION ADDRESS:

160 CSAVEM"XCMP", S, S+427, S 170 PRINT"REMEMBER TO CLEAR 200, "S-1 180 PRINT"BEFORE YOU CLOADM AND EXEC THIS PROGRAM": END 190 DATA 142, 0, 25, 175, 141, 1 , 163, 220, 27, 131 200 DATA 0, 4, 221, 27, 158, 25, 156, 27, 16, 44 210 DATA 1, 111, 156, 27, 16, 44 1, 42, 51, 4 220 DATA 31, 50, 166, 192, 77, 1 6, 39, 0, 191, 129

230 DATA 130, 16, 39, 0, 185, 12 9, 131, 16, 39, 0 240 DATA 177, 129, 255, 16, 39, 0, 160, 129, 134, 16 250 DATA 39, 0, 128, 23, 0, 233, 16, 39, 0, 151 260 DATA 129, 32, 16, 39, 0, 147 , 129, 34, 39, 52 270 DATA 129, 38, 38, 12, 167, 1 60, 166, 192, 129, 72 280 DATA 39, 21, 129, 79, 39, 12 5, 23, 0, 167, 39

290 DATA 43, 37, 120, 129, 65, 3 7, 116, 129, 90, 34 300 DATA 112, 32, 41, 167, 160, 166, 192, 23, 0, 146 310 DATA 39, 247, 129, 65, 37, 1 64, 129, 70, 47, 239 320 DATA 32, 158, 167, 160, 166, 192, 39, 92, 129, 34

330 DATA 39, 79, 32, 244, 167, 1 60, 166, 192, 141, 116 340 DATA 38, 138, 39, 246, 167, 160, 166, 192, 129, 65 350 DATA 37, 7, 129, 90, 35, 9, 22, 255, 121, 141 more

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360 DATA 95, 16, 38, 255, 115, 1
67, 160, 166, 192, 16
370 DATA 39, 255, 107, 141, 114,
 16, 39, 255, 101, 32
380 DATA 242, 167, 160, 166, 192
, 39, 33, 129, 58, 39
390 DATA 20, 129, 34, 38, 242, 1
67, 160, 166, 192, 39
400 DATA 19, 129, 34, 39, 232, 3
2, 244, 167, 160, 166
410 DATA 192, 167, 160, 166, 192
, 22, 255, 62, 49, 63
420 DATA 79, 167, 160, 52, 16, 4
9, 59, 16, 172, 225
430 DATA 39, 9, 175, 141, 0, 180
, 174, 132, 22, 255
440 DATA 27, 16, 174, 132, 174,
141, 0, 168, 16, 175
450 DATA 132, 31, 33, 22, 255, 1
2, 129, 46, 39, 8
460 DATA 129, 48, 37, 6, 129, 57
, 34, 2, 26, 4
470 DATA 57, 36, 35, 40, 41, 42,
 43, 44, 45, 47
480 DATA 58, 59, 60, 61, 62, 63,
64, 94, 0, 52
490 DATA 16, 133, 128, 38, 13, 4
8, 140, 229, 109, 132
500 DATA 39, 10, 161, 128, 39, 2
 32, 246, 26, 4
510 DATA 53, 144, 28, 251, 53, 1
44, 158, 25, 156, 27
520 DATA 44, 57, 51, 4, 166, 192
 38, 252, 174, 132
530 DATA 156, 27, 44, 30, 239, 1
41, 0, 78, 31, 18
540 DATA 174, 132, 141, 48, 236,
 161, 237, 193, 166, 160
550 DATA 167, 192, 166, 160, 167
, 192, 166, 160, 38, 250
560 DATA 167, 192, 32, 222, 79,
95, 239, 159, 1, 170
570 DATA 237, 193, 223, 27, 223,
29, 223, 31, 57, 158
580 DATA 25, 111, 128, 111, 128,
 159, 27, 159, 29, 159
590 DATA 31, 57, 52, 118, 158, 2
5, 156, 27, 44, 14
600 DATA 16, 174, 132, 16, 172,
100, 38, 2, 239, 132
610 DATA 31, 33, 32, 238, 53, 24
6, 255, 0
```

		Program Listing 3. Cruncher	3. Cruncher				
	00010 *********************************	****	0016 9C 1B 0018 102C 012A 001C 33 04	00340 MAIN 00350 00360	CMPX LBGE LEAU	LAST UPDATE	SAME AS ABOYE ONLY THIS TIME, UPDATE MEMORY ADR. OF CONDENSED TEXT
	00030 * COMPRESS		001E 1F 32	00370	TFR	U, Y	ADR. OF TEXT TO BE CONDENSED
	00050 * BY WILLIAM HARRIS		0020 AB	* 00390	POT	+0.	FIRST CHAR
	* 06000			00400 * LINE: 00410 *		TER-BY-C	CHARACTER-BY-CHARACTER CHECKER
	* PROGRAM COMPRESSES BASIC PROGRAMS	IN MEMORY	4D	00420 LINE	TSTA		WAS THIS THE END OF THE LINE?
	*		1027	00430	LBEQ	NEXTLN	
	00120 * PROCEDURE FOR USING PROGRAM:			00440	CMPA	#\$82	TEST FOR "REM"
	*	PROGRAM	102/	00450	LBEQ	# COS	ORDINARY REM
	*			00470	LBEO	REVERS	GET RID OF LAST CHARACTER
	*		81	00480	CMPA	#\$FF	CHECK FOR INTRINSIC TOKENS
			1027	00490	LBEQ	NTRINS	INTRINSIC TOKEN
	**********	****	81	00200	CMPA	98\$#	CHECK FOR DATA STATEMENTS
001B	LAST EQU 27 NEXT FREE	SPACE IN BASIC	1027	00510	LBEQ	DATA	IF DATA, SAVE ALL OF DATA LINE
	BEGIN EQU 25	LINE IN BASIC	17	00520	LBSR	SPTEST	LOOK FOR BYTES WE WANT TO KEEP
8E	00210 START LDX	NG POINTER	1027	00530	LBEQ	NEXT	ZERO MEANS SOME BYTE TO KEEP
AF &	00220 STX SAVE, PCR		81	00540	CMPA	-#	CHECK FOR SPACES
0007 DC 1B	00230 LDD LAST CHANGE LAST FOR EASE IN	EASE IN	0048 1027 0093		LBEQ	IGNORE	IF SPACE, DON'T SAVE IT
0009 83 0004	SIIBD #4		18	00550 STRCHK	CMPA	# :: #	THE WAS A STRING - VEED ALL OF IT
DD			81	00580 HEXCHK	CMPA	# - Es	HEXADECIMAL OR OCTAL CONSTANT?
000E 9E 19	LDX BEGIN ADR. OF FI	RST LINE OF PROGRAM	26	00200	BNE	NUMBER	NO-CHECK FOR A NUMBER
0010 9C 1B	00280 CMPX LAST NO LINES?		A7	00900	STA	+ X +	IT WAS-NOW DO FURTHER CHECKING
0012 102C 016F	LBGE RETURN YES-FORGET	REST OF PROGRAM.	A6	00610	LDA	+0'	NEXT CHAR
	*		81	00620	CMPA	н, #	HEXADECIMAL CONSTANT?
	* MAIN: MAIN ROUTINE FOR GETTING	RID OF UNWANTED	27	00630	BEQ	GETHEX	YES-GO TO HEXADECIMAL SAVER
	00320 * CHARACTERS 00330 *		005C 81 4F 005E 27 7D	00640	CMPA	# O NEXT	OCTAL CONSTANT? YES-SAVE
							₩ more

COLOR COMPUTER Systems SOFTWARE

EDITOR ASSEMBLER DEBUGGER

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CCEAD: This 8K Basic Program supports cassette files, has full cursor control, line insertion/deletion, and much more. Two pass assembler supports full 6809 instruction set & addressing modes, lists to screen or printer. Debugger allows memory examine/modify, program execution. If not delighted return within 2 weeks for a full refund. You get fully commented Basic source & complete instructions.

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COLORCOM/E: This terminal program has everything! PLUS it's in a convenient plug-in cartridge. LOOK at these features.

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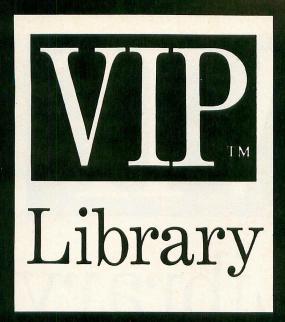
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EATUP IT WAS IN RANGE-NOW SAVE AND LINE OTHERWISE, RESUME MAIN LOOP NUMCHK CHECK FOR NUMBER IF <> 0 (SEE LINE NOT NUMBER IF <> 0 (SEE NUMCHK SUBROUTINE DESCRIPTION ES ALL LETTERS FROM VARIABLES AFTER IRST TWO CHARACTERS , y + SAVE LAST SIGNIFICANT CHAR LINE END OF LINE SPTEST IT WAS—SEND BACK TO MAIN LOOP EATI TOO—LONG VARIABLE ALL OF DATA LINES UP TO AND INCLUDING CHECK FOR STRINGS SO COLONS INSIDE.	SAVE CHAR END OF LINE 1S THIS END OF DATA? YES STRING? NO SAVE STRING NEXT CHAR END OF STRING? YES MORE STRING?	OF COLOR BASIC'S INTRINSIC TOKENS SAVE INTRINSIC TOKEN FLAG GET INTRINSIC TOKEN FLAG GET INTRINSIC TOKEN FLAG SEJOIN MAIN LOOP AT CHAR SAVE SAVE CHAR FOUND IMPORTANT GET WAXT CHAR—IF LAST CHAR WASN'T IMPORTANT, BRANHING HERE CAUSES DELETION OF CHAR BACK TO START OF MAIN LOOP USED FOR 'STYLE REMARKS, WHICH ARE STORED :' IN MEMORY OF LINE CHARACTER FOR BASIC, is OF NEXT LINE FORCE BND OF LINE MAKE SURE BASIC KNOWS ABOUT IT SAVE ENT TINE FOR COMPARISON US, Y ADJUGT TY FOR BASIC'S OVERHEAD IF Y WAS THE SAME AS X ON STACK, THEN THIS LINE IS EMPTY IF THIS LINE IS EMPTY, ADJUST ILINE SAVE LAST LINE POINT TO NEXT LINE GET NEXT LINE GET LAST LINE GET LAST LINE FOLLOWS THE LAST LINE THIS LINE THIS LINE FOLLOWS THE LAST LINE THIS LINE FOLLOWS THE LAST LINE THIS LINE
LS EATUP IT W TAKE BRA LINE OTHE SR LINE CHEC BRE LINE NOT UMCK DELETES ALL LETTER THE FIRST TWO CHAR TA 'Y+ SAVE DA 'INE END SR STEST CHEC SRADE ALL OF DATA L COLONS. CHECKS POR	, Y+ , U+ NEXTLN H:: NEXT H:: DATA , Y+ , U+ , U+ , U+ , U+ , U+ , U+ , U+ , U	CARE UH+ UH+ UH+ UH UH UH UH UH UH
и чич . Оччичи	STA BEQ CMPA BEQ CMPA BEQ BNE STA LDA BEQ CMPA BEQ	S: TAKES STA LDA LDA LDA LEAY LDA LEAY CLRA STA CLRA STA CRA CRA CRA CRA CRA CRA CRA CRA CRA CR
* CONUM CONUM EATUP EAT1 ** DATA:	ADATA COLON DATSTR	NTRINS: NTRINS: NTRINS: NEXT:
0013300 0013300 0013300 0013300 0013300 0013300 0014400 00144400 0014400 0014400 0014400 0014400 0014400 0014400 0014400 0014400 0014400 0014400 0014400		01050 01050 01050 01050 01050 01170
		98 84 84 84 84 84 84 84 84 84 84 84 84 84
23 09 8D 5F 1026 FF73 1026 FF73 A7 A0 A7 C0 1027 FF6B 8D 72 20 FE	7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AF AF
00A4 23 00A6 16 00A8 10 00AB 10 00B1 A6 00B1 A6 00B3 10 00B9 10 00B9 10	00BF A7 00C1 27 00C2 27 00C5 81 00C7 27 00C9 86 00CD A7 00CF A6 00D1 27 00D5 31	0000 A7 0000 A7 0000 A7 0000 B A6 0000 16 0000 16 0000 10 0000 10 0000 10 0000 10 0000 10 0000 10 0000 10 0000 10 0000 10 0000 10
ENNN WILL BE AN OCTAL CONSTANT, BE CHECKED WITH THE OTHER NUMBERS I WAS THIS A NUMBER? I VES I LESS THAN ZERO-NOT NUMBER OR ANTHHING ELSE IF GREATER THAN 9, STILL MIGHT BE A VARIABLE, SO WAS CHAR IN RANGE A-Z? NO	SAVE LAST CHAR GET NEXT CHAR CHECK FOR NUMBER IT WAS-ASSUME VALID PART OF HEXADECTMAL CONSTRANT IS IT IN RANGE OF A-F? NO-INVALID HEX CONSTRANT IT IS IN A-F, AND THEREFORE IT IS IN A-F, AND THEREFORE VALID HEXADECIBAL CONSTRANT ONLY IN A-F-AND HEXADECIBAL CONSTRANT	H H O H O H O H O H O H O H O H O H O H
AND CAN BE CHECKE. R NUMCHK WAS TH GETTUN YES IGNORE LESS TO ANYTHII IF GRE BE A U BE A U IGNORE NO A # 'A MAS CH IGNORE NO A # 'Z IGNORE NO GETUAR ASSUME CHECKS FOR VARIABLE A # 'Z IGNORE NO GETUAR ASSUME CHECKS FOR VALID HE SAMES THEM	, X+ , U+ NUMCHK GETHEX # 'A # 'A # 'F GETHEX	TAKES STRINGS AND THEY ARE PRESENTY A # 1. A # 1. CHECK FOR NUMERAL TWA THE SAVE LINE CHECK FOR VALID V ELIMINATES EXTRA CHECKS FOR VALID V ELIMINATES EXTRA CHECK CNUM A # 1.
MP MP RAI	STA LDSA LBSR BEQ CMPA CMPA BLO CMPA BLE	M L M D H N N D H N N D H N N D H N N D H N N D H N N D H N N D H N N D H N N D H N N N D H N N N D H N N N N
NUMBER L NUMBER L B B B ** VARCHK: C VARCHK C C C C C C C C C C C C C C C C C C C	* GETHER * * * *	GETSTR: GETSTR: GETSTR: GETTVAR: GETTVAR: C C C C C C C C C C C C C C C C C C C
F H U	(+)	***** 0 ***** 0 *
00660 00670 00720 00720 00730 00730 00730 00740 00750 00750 00790 00810 00810 00810 00810 00810 00810 00810 00810 00810 00810 00810		000970 000980 01000 010100 010100 010020 010020 01000 01100 011100 011120 01120 01220 01220 01220 01220 01220 01220 01220 01220 01220 01220
*** *** ** ***		A0 00970 00980 009
000660 000670 000680 00070 000720 000730 00070 00070 00070 00080 000800 00080 000800 000800 000800 000800 000800 000800 000800 000800 000800 0	00 00 00 00 00 00 00 00 00 00 00 00 00	



ANNOUNCING The VIP Library™ With a Terrific Sale!

Nelson Software Systems is now Softlaw Corporation, under new management. Our Super "Color" Library programs have also undergone a name change. All programs are the same unbeatable Super "Color" Library programs you've heard so much about, but with new VIP names. To introduce our VIP Library we are having a special sale on the following pages. Our low prices for such high quality can't be beat so get started today!

'Diamonds in the mud puddle of Color Computer software!'

The Library Concept

State of the Art, Quality, Integrity, Compatibility and Affordability. Five things good software must possess. Five things that epitomize the VIP Library™. Each program is the diamond of its class, true excellence. These programs are first in features, first in power, first in memory, and all are affordably priced.

State Of The Art

All Library programs are written in machine code specifically for the Color Computer, to work without the interference of a separate operating system such as FLEX. From this comes speed and more workspace for you. Library programs work perfectly with every Color Computer, from 16 to 64K. The most advanced hardware and software techniques are used to place programs in rompak cartridges for instant loading and total workspace with any Color Computer.

Perfection With 16, 32 or 64K

The programs do not depend on BASIC, and so allow total compatibility and workspace with any size Color Computer, even 64K. Unlike other programs for the Color Computer which are said to be 64K compatible, VIP Library™ programs are not limited to between 24 and 30K of workspace in 64K. Library programs have Memory Sense with BANK SWITCHING to fully use all 64K, thus giving an astounding 61K of workspace with the rompak cartridge, and up to 51K with a disk version!

Lowercase Displays

State-of-the-Art graphics allow instant use of four display colors, and eight lowercase displays featuring descending lowercase letters. You can select from 51, 64 or 85 columns by 21 or 24 lines per screen, with wide or narrow characters in the 64 display. These screens provide a pleasant and relaxing way to perform your tasks, with as much text on the

". . . PICTURE getting your instantaneous investment report over the phone, using it in your spreadsheet calculation, generating a report, and writing a memo including that report and data from your database with your word processor, and all this with VIP Library™ programs . . ."

screen as is possible. Each program is easy to learn and a joy to use. We take pride in the stringent testing done to make these programs perform flawlessly. Every feature, every convenience, sleek, simple and elegant.

Total Compatibility

All **Library** programs are compatible. Transfer and use of files between programs is easy and carefree. What's better, when you have learned one program the others will come easy. And every program is the best of its kind available.

The Library Programs

For your writing needs is the VIP Writer™, and its spelling checker, the VIP Speller™. For financial planning and mathematical calculations you can use the VIP Calc™. To manage your information and send multiple mailings there is the VIP Database™. For sending all these files to and from home or the office and for talking to your friends you can have the VIP Terminal™. Finally, to fix disks to keep all your Library files in good repair we offer the VIP Disk-ZAP™.

Mini Disk Operating System

The Disk versions each have a Mini Disk Operating System which will masterfully handle from 1 to 4 drives. It offers smooth operation for such features as the ability to read a directory, display free space on the disk, kill files, save and automatically verify files, and load, rename and append files. **Library** programs simply do not have the limitations of BASIC.

Professionalism

The **Library** comes handsomely bound in gold-embossed, padded leatherette binders to grace your work area with the professionalism it deserves. Welcome the **VIP Library™** into your home and office.

A description of each of the **Library** programs, with the special sale price, is contained in the following pages. Please indulge!

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VIP Writer™

By Tim Nelson RATED TOPS IN RAINBOW, HOT COCO, **COLOR COMPUTER MAGAZINE AND BASIC COMPUTING** The Official Dragon Microcomputer Word Processort

The most powerful and easy-to-use word processor is available in the showpiece and workhorse of the **Library: The VIP Writer™**. Because of its undisputed superiority over all Color Computer word processors, it was selected by Dragon Data Ltd. of England to be the Official Word Processor for its line of Dragon microcomputers

The result of two years of research, the VIP Writer™ offers every feature you could desire from a word processor. It is the most powerful, fastest, most dependable and most versatile. With the display, workspace and compatibility features built into the Library the Writer is also the most usable.

". . . Nearly every feature and option possible to implement on the Color Computer. The design of the program is excellent; the programming is flawless . . . Features for the professional, yet it is easy enough for newcomers to master . . . Certainly one of the best word processors available for any computer . . ." October 1983 "Rainbow"

The Writer will work with you and your printer to do things you always wanted to do. Every feature of your printer can be put to use, every character set, every graphics capability at any baud rate, EVEN PROPORTIONAL SPACING. All this with simplicity and elegance.

Although all versions feature tape save and load, the disk version provides the Mini Disk Operating System common to the whole **Library**, plus disk file linking for continous printing.

Professional features of particular note:

- Memory-Sense with BANK SWITCHING to fully utilize 64K, giving not just 24 or 30K, but up to 61K of workspace with the rompak version and 50K with the disk version.
- TRUE FORMAT WINDOW to EXACTLY replicate the printed page ON THE SCREEN BEFORE PRINTING, showing centered line headers, FOOTNOTES, page breaks, page numbers, & margins in line lengths of up to 240 characters. It makes HYPHENATION a snap.
- A TRUE EDITING WINDOW in all 9 display modes for those extra wide reports and graphs (up to 240 columns!).
- FREEDOM to imbed any number of PRINTER CONTROL CODES anywhere, EVEN WITHIN JUSTIFIED TEXT.
- Full 4-way cursor control, sophisticated edit commands, the ability to edit any BASIC program or ASCII textfile, SEVEN DELETE FUNCTIONS, LINE INSERT, LOCATE AND CHANGE, wild card locate, up to TEN SIMULTANEOUS block manipulations, word wrap around, programmable tabs, display memory used and left, non-breakable space, and headers, footers and FOOTNOTES.
- The ability to control ANY PRINTER, using dynamic text formatting with 27 comprehensive format parameters.
- Automatic justification, automatic pagination, automatic centering, automatic flush right, underlining, superscripts, subscripts, pause print, single-sheet pause, and print comments.
- Type-ahead, typamatic key repeat and key beep for the pros, ERROR DETECTION and UNDO MISTAKE features, 3 PROGRAM-MABLE functions, auto phrase insert, column creation, an instant HELP TABLE, and a 110 page, fully indexed tutorial.

16K ROMPAK \$59.95

32K DISK \$59.95

†Sold as the Dragon Writer™ ONLY by Dragon Data Ltd. and its distributors.

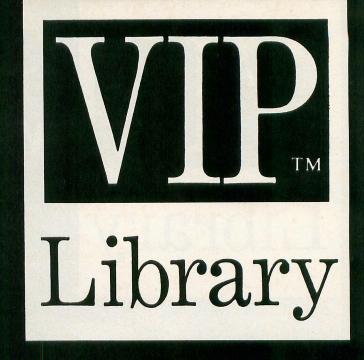
VIP Speller™

(Formerly Super "Color" Speller)
THE WRITER'S ESSENTIAL COMPANION

Spelling checkers are an invaluable aid to every writer. Habitual misspellings and typos can be found without the eyestrain, boredom and fatigue associated with endless proofreading. The VIP Speller™ is a fast, machine-code proofreading program to correct any VIP Library" or other ASCII file. It automatically proofreads your documents against a 20,000 word stock dictionary, plus your own customized dictionary and corrects typos or marks them for special attention.

DISK ONLY \$49.95

Lowercase displays not available with this program.



TRUE VISICALC™ POWER! By Kevin Herrboldt

- * UP TO 5 TIMES THE SCREEN DISPLAY AREA OF OTHER SPREADSHEETS!
- STATE OF THE ART LOWERCASE DISPLAYS
 MEMORY SENSE WITH BANK SWITCHING FOR UP TO 61K in 64K!
- ROMPAK CARTRIDGE FOR TOTAL WORKSPACE EXCLUSIVE VIDEO DISPLAY WINDOWS EVEN UP TO 16!
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- **WORKS WITH ANY PRINTER, EVEN LETTER QUALITY!**
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- 16 DIGIT PRECISION FOR THOSE SPECIAL SCIENTIFIC USES
- **ALMOST UNLIMITED PROGRAMMABLE FUNCTIONS**

VIP Calc™ is truly the finest and easily the most powerful electronic worksheet and financial modeling program available for the Color Computer, from 16 to 64K. Now every Color Computer owner has access to a calculating and planning tool better than VisiCalc™, containing all its features and commands and then some, WITH USABLE DISPLAYS. Use Visicalc templates with VIP Calc™!

There's nothing left out of **VIP Calc™**. Every feature you've come to rely on with VisiCalc™ is there, and then some. You get up to **5 TIMES** the screen display area of other spreadsheets for the Color Computer and Memory-Sense with BANK SWITCHING to give not just 24, or 30, but UP TO 61K OF WORKSPACE IN 64K!!! This display and memory allow you the FULL SIZE, USABLE WORK-SHEETS you require. You also allow you the FULL SIZE, USABLE WORK-SHEETS you require. You also get: User definable worksheet size, up to 512 columns by 1024 rows! * Up to SIXTEEN VIDEO DISPLAY WINDOWS to compare and contrast results of changes * 16 DIGIT PRECISION * Sine, Cosine and other trigonometric functions, Averaging, Exponents, Algebraic functions, and BASE 2, 8, 10 or 16 entry * Multi-layered Column and Row, Ascending and Descending SORTS for comparison of results * LOCATE FORMULAS OR TITLES IN CELLS * Easy entry, replication and block moving of frames * Global or Local column with control up to 81 harvests width page cell * Create titles of up to 255 changesters as cell * characters width per cell * Create titles of up to 255 characters per cell * Limitless programmable functions * Typamatic Key Repeat * Key Beep * Typeahead * Print up to 255 cloumn worksheet * Prints at any baud rate from 110 to 9600 * Print formats savable along with worksheet * Enter PRINTER CONTROL CODES for customized printing with letter quality or dot matrix printer * Combine spreadsheet tables with VIP Writer* documents to create ledgers, projections, statistical and financial reports and budgets. financial reports and budgets.

Both versions feature Tape save and load, but the disk version also has the Mini Disk Operating System of the entire Library.

16K ROMPAK \$59.95

32K DISK \$59.95

NEW SALE PRICES!

- Nine Display Formats: 32 by 16 51, 64, 85 by 21 or 24
- True Lowercase & Descenders
- Four Different Display Colors
- 16, 32 & 64K Compatible
- Memory Sense Bank Switching
- Up to 51K Disk, 61K Rompak
- Mini Disk Operating System
- **Compatible With All Printers**

A SPECIAL OFFER ON THE WHOLE LIBRARY —

The entire Library, all six great disk programs, can be purchased for only \$300!

(Formerly Super "Color" Terminal)
THE FINEST TERMINAL PROGRAM ANYWHERE!

By Dan Nelson

From your home or office you can join the communication revolution. The VIP TerminalTM opens the world to you. You can monitor your investments with the Dow Jones Information Service, or broaden your horizons with The Source or Compuserve, bulletin boards, other computers, even the mainframe at work.

Picture getting your instantaneous investment report, incorporating it in your spreadsheet calculation, generating a report, and writing a memo incorporating that report and data from your database, all with **Library** programs. Then you can transmit the report to work, or wherever, long distance. The **VIP Terminal**** will become the hub of your Library.

FEATURES: Memory-Sense with BANK SWITCHING for full use of workspace, from 16 to 64K * Selectively print data at baud rates from 110 to 9600 * Full 128 character ASCII keyboard * Automatic graphic mode * Word mode (word wrap) for unbroken words * Send and receive Library files, Machine Lanuage & BASIC programs * Set communications baud rate from 110 to 9600, Duplex: Half/Full/Echo, Word length: 7 or 8, Parity: Odd/Even or None, Stop Bits: 1-9 * Local linefeeds to screen * Save and load ASCII files, Machine Code & BASIC programs * Lowercase masking * 10 Keystroke Multiplier (MACRO) buffers to perform repetitive pre-entry log-on tasks and send short messages * Programmable prompt or delay for send next line * Selectable character trapping * Send up to ten short messages (KSMs), each up to 255 characters long, automatically, to save money when calling long distance.

All versions allow tape load and save of files and KSMs, but the disk version also has the Mini Disk Operating System common to the Library.

16K ROMPAK \$49.95

16K DISK \$49.95

Disk version requires 32K for lowercase displays.



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AUTHOR'S SUBMISSIONS ARE ENCOURAGED.

VIP Database™

INCLUDES MAIL MERGE CAPABILITIES TOO!

By Tim Nelson

This high speed MACHINE LANGUAGE program fills all your information management needs, be they for your business or home. And it does so better than any other database program for the Color Computer, featuring machine code, lowercase screens and mailmerge capabilities. Inventory, accounts, mailing lists, family histories, you name it, the VIP Database™ will keep track of all your data, and it will sort and merge VIP Writer™ files.

The VIP Database™ features the Library Memory Sense with BANK SWITCHING and selectable lowercase displays for maximum utility. It will handle as many records as fit on your disk or disks. It is structured in a simple and easy to understand menu system with full prompting for easy operation. Your data is stored in records of your own design, each divided into up to 255 fields. Each field will hold up to 255 characters. All files are fully indexed for speed and efficiency. Full sort of records is provided for easy listing of names, figures, addresses, etc., in ascending or descending alphabetic or numeric order. You may also combine files, sort and print mailing lists, print "boiler plate" documents, automatically insert text in standardized forms, address the list in address the provided that the provided text in standardized forms, address the list in address the provided text in standardized forms. list is endless. The math package even performs arithmetic operations and updates other fields. Create files compatible with the VIP Writer and VIP Terminal. Up to five different print formats are available, and control codes may be imbedded for use with all printers.

As with all other **Library** programs, the **Database** features the powerful Mini Disk Operating System.

32K DISK \$59.95

Disk-ZA

RAVED ABOUT IN THE APRIL 1983 "RAINBOW!"

By Tim Nelson

Your database file disk, form letter disk, or BASIC program disk goes bad. An I/O error stops loading, or even backing up of the disk. Weeks, even months of work sit on the disk, irretrievable. Now catastrophic disk errors are repairable, quickly and with confidence, using the VIP Disk-ZAP™. It is the ultimate repair utility for simple and quick repair of all disk errors. Designed with the non-programmer in mind, the VIP Disk-ZAP™ will let you retrieve all types of bashed files, BASIC and Machine Code programs.

This high-speed machine code disk utility has a special dual cursor screen display to look at the data on your disk. You are able to: Verify or modify disk sectors at will * Type right onto the disk to change unwanted program names or prompts * Send sector contents to the printer * Search the entire disk for any grouping of characters * Copy sectors * Backup tracks or entire disks * Repair directory tracks and smashed disks * Full prompting to help you every step of the way * 50-plus page Operators Manual which teaches disk structure and repair.

16K DISK \$49.95
Lowercase displays not available with this program.



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MAIL ORDERS: \$3.00 U.S. Shipping (\$5.00 CANADA; \$10.00 OVERSEAS), Personal checks allow 3 weeks.

All Disk Programs are also available on 3" Diskettes for the Amdek Color AMDISK-III Micro-Floppy Disk System for an additional \$3.00 each.

🖀 Enter 24 on Tele Response page

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SAVE CURRENT LINE'S BEGINNING GET ADRO OF NEXT LINE ADJUST ALL LINE NUMBERS REFERING TO ,X TO REFER TO ,U SAVE BASIC'S 4 BYTE DESCRIPTOR BEGINNING BYTES STORED CONTINUE TRANSFERAL UNTIL 0 END OF LINE-PUT EOL FLAG IN MAKE REGISTER D ZERO SAVE NEXT AVALLABLE SPOT FLAG END OF PROGRAM TELL BASIC ABOUT NEW MEMORY	DO THE EQUIVALENT OF "NEW" SOF LINE IN U	GET FIRST LINE ADR. BUD OF PROGRAM? NO-CHECK NEXT LINE X REGISTER DOESN'T REFER TO THIS LINE REPLACE WITH NEW LABEL NEXT LINE NEXT LINE NEXT LINE TEMPORARY STORAGE	NUMNO 0118 NUMYES 0116 RETURN 0185 RETURN 0185 RETURN 0185 SAVE 01A9 SPLOOP 0134 SPLOOP 0134 SPLOOP 0134 SPLOOP 0135 SPREST 012B SPREST 012B SPREST 010B SPREST 010B SPREST 010B SPREST 010G
X, Y A, X A, X A, X A, X A, Y	RETURN LDX BEGIN CLR ,X+ CLR ,X+ CLR ,X+ CLR ,X+ CLR ,X+ CLR ,X+ LAST STX LAST STX LAST+4 RTS * SUBROUTINE ADJUST * ARGUMENTS: NEW ADDRES	03030 ADJUGT PSHS X,Y,D,O 03040 LDX BECIN 03060 ADLOOP GE ADEND 03070 LDY ,X 03080 CMPY 4,S 03100 BNE ADENST 03100 BNE ADENST 03120 ADPAST TER Y,X 03120 ADEND BTS X,Y,D,O 03130 ADEND BTS X,Y,D,O 03140 ADEND BTS X,Y,D,U 03150 SAVE RMB 2,Y,D,U 03160 SAVE RMB 2,Y,D,U	EXIT 0176 GETHEX 0071 GETTUM 0090 GETYST 0094 GETYAR 009A HEXCHK 0050 IGNORE 00DF LAST 00DF LINE 0022 MIN 0016 NEXT 00D9 NUMER 0060 NUMCHK 010A
	0.184 39 0.185 9E 19 0.187 6F 80 0.188 6F 80 0.188 9F 1B 0.181 9F 1D 0.191 39	0192 34 76 0194 8 19 0194 9C 18 0198 2C 0E 0198 10AC 64 019D 10AC 64 01A 2E 84 01A 1F 21 01A 1F 21 01A 35 F6 01A 35 F6 01A 35 F6 01A 35 F6	ADEND 01A8 ADJUST 0192 ADJUST 0195 ADPAST 011A4 BEGIN 0019 CN01 016C CNDENS 0154 CNUM 00A9 COLON 00C5 DATA 00BF DATATR 00CB DATATR 00CB EATI 00BI EATUP 00AF
SUBROUTINE NUMCHK ARGUMENTS: CHARACTER TO BE TESTED IN REGISTER A RETURNS: ZERO FLAG IN CC REG IF NUMBER PLUS FLAG IN CC IF GREATER THAN 9, MINUS FLAG IN CC IF LESS THAN 0. MCHK CMPA #'. CHECK FOR DECIMAL POINT BEQ NUMNYES CREATER THAN 9; BLO NUMNO YES-NOT NUMBER CMPA #'0 CREATER THAN 9; BLO NUMNO YES-NOT NUMBER CMPA #'0 GREATER THAN 9; BLO NUMNO YES-NOT NUMBER CMPA #'0 GREATER THAN 9; BLO NUMNO YES-NOT NUMBER CMPA #'0 GREATER THAN 9; BLO NUMNO YES-NOT RUMBER CMPA #'0 GREATER THAN 9; BLO NUMNO YES-NOT RUMBER CMPA #'0 GREATER THAN 9; BLI NUMNO YES-NOT RUMBER MYES ORCC #\$04 SET ZERO FLAG MNO RTS LEAVE FLAGS AS THEY ARE	WENTS: CHARACTER TO BE TESTED IN REGISTER A RAS: ZERO FLAG SET IN CC IF CHAR WAS A CHARACTER SPECIAL TO BASIC IN SOME WAY ZERO FLAG RESET IF NOTHING SPECIAL ABOUT CHAR IN REGISTER A 3 OF SPECIAL CHARACTERS FCC 15#()*+,-/:;<=>?@~1 (Note: Object code vertically compressed to save roomEds.)	PECB 0	CRUNCHED BASIC PROGRAM DOWN IN MEMORY **************************** LDX BEGIN FIRST LINE'S ADDRESS CMPX LAST IF PROGRAM REDUCED TO NOTHING CMPX LAST IF PROGRAM REDUCED TO NOTHING LEAU 4, X GET START OF LINE LDA , U+ SKIP FIRST LINE LDA , U+ SKIP FIRST LINE LDA , U+ SKIP FIRST LINE LDA , X GO TO NEXT LINE LDX , X GO TO NEXT LINE CMPX LAST LAST LINE SGT SAVE, PCR SAVE PREVIOUS LINE CMPX LAST LAST LINE? STU SAVE, PCR SAVE PREVIOUS LINE END
******* 0 00***	0.220 A ACGUMENTS 0.2230 * ARGUMENTS 0.2240 * 0.2250 * RETURNS: 0.2250 * RETURNS: 0.2270 * 0.2290 * 0.	012A 00 02320 012B 34 10 02340 012F 26 0D 02340 013I 30 8C E5 02350 013I 6D 84 02370 013B A1 80 02380 013B A1 80 02400 013C 20 02400 013C 20 02410 013C 20 02420 013E 1A 04 02430 014U 1C PB 02450 0144 35 90 02440 ********	0146 9E 19 02500 * UPDATE: 02500 * UPDATE: 02510 * UPDATE: 025

OS-9 of FLEX

O-PAK: Hi-Res screen formats for RS OS-9, plus XCOPY utility to copy files from OS-9 to FLEX to RS DOS and vice	language programs, and 6809 assembly code to position-independent code and data.
Versa! For OS-9	OS-9 (Object only) \$75.00 FLEX (Object only) \$50.00
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CRASMB: Use the MACRO cross assembler and any of the following CPU personality modules (CPM's) to assemble	bler, Hi-RES screens and MORE!
that CPU's source code into OS-9, FLEX, Motorola S1-S9 or Intel-HEX formatted Object code files. Available CPM's:	FHL FLEX Color UTILITIES: This combination of TOOLKIT
Motorola 6800-2-8, 6801-3, 6805, 6809, MOSTEK 6502, RCA	#2 and EXTENDED UTILITIES for FLEX includes: REPAIR, SCAN, REPLACE, INIT, USERINFO, LOAD, SAVETEXT,
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Standard OS-9:	STYLOGRAPH: A complete word processing system which offers total formatting control.
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text form only. Available for Color Computer.	SUPER SLEUTH: Examine and modify or disassemble
OS-9	binary program files into source code format. Object code for 6800, 01, 02, 03, 05, 08, 09, or 6502 may be processed.
	Object only: With Source:
6800 - 6809 and 6809 PIC/PID TRANSLATORS: Convert 6800/1 assembly language programs to 6809 assembly	CoCo OS-9\$49.95 OS-9\$99.00 CoCo FLEX\$50.00 FLEX\$99.00

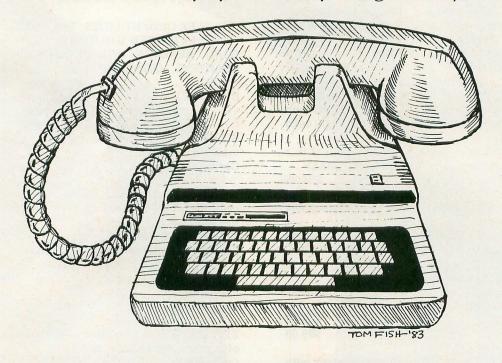
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CompuServe Connection

A look into a popular computing activity.



by Terry Kepner

HO OR WHAT IS CompuServe? CompuServe is an information service available to computer and video terminal owners. Using CompuServe, you can book airline tickets for a trip; look up the latest information regarding FDA regulations; farmers can determine the cost break-even point of a crop; you can find current-date quotes on over 12,000 stocks and bonds; join a CB club; read reviews about the latest movies; or access any of the hundreds of other services, databases, and groups on-line in the CompuServe network.

CompuServe's services have enough variety (the index has over 700 entries) to keep you busy for many hours. The average user can spend several hours just looking things over and exploring the databases.

Ah! The Databases

The databases on CompuServe have hundreds of programs, and thousands of words of advice. If you like to trade programs you've written with other people, you'll love the selection available. If you're interested in how your computer works, the Special Interest Groups have the latest information, as well as the answers to almost all your questions. In fact, many times you can find the authors of major software and hardware packages on-line and answering questions from their customers. It's much more personal, and generally faster to describe your problem and get your solution direct from the author instead of from a store salesman.

If you have problems with equipment,

many times you can leave a message and have your problem solved by one of the many experts that are members of CompuServe (experts like Jake Commander, Ed Juge, Bill Walters, and Kim Watt, to name but a few). And almost all computer magazine staffs regularly scan the boards for messages and leave updated information about programs they've published. To try to list even a fraction of the services available would take up this entire article, and wouldn't even start to cover the various ways you can benefit from perusing the bulletin board systems (BBS for short).

All in all, most people find a Compu-Serve membership to be well worth the price, which is only \$6.00 an hour for non-prime time (i.e., after 6 p.m. and before 8 a.m.), plus whatever charges you run up on your phone connection. If you're lucky enough to live in one of the 150-plus cities with a direct CompuServe link, you won't have to add long distance phone charges to your bill like I do ("only" \$.21 per minute where I am). Even if you don't live near a city with a CompuServe number, you might be able to tie on with a local number through the GTE, DataPac, Telenet, or Tymnet phone networks (which have hundreds of phone numbers all across the country); these do add a modest charge to your bill, though.

To use the service you'll need a Color Computer (or any other computer or terminal with an RS-232 port), modem, a cable to connect the two, some type of terminal software, a telephone, and a password for the CompuServe Information Service (or CIS, as it's known to its friends and users). The modem can be an acoustic or a direct-connect device. The acoustic type has two cups into which you place the telephone handset; the direct-connect device has a modular plug that you plug into the phone lines in place of your telephone. Which device you buy is up to you, although acoustic modems are usually less expensive. If you shop around you'll probably find an acoustic modem for less than \$100. As for software: the May 1983 issue of The Color Computer Magazine has a comparison of several terminal packages for the Color Computer.

If you decide to use Tandy's Videotex package, you automatically get your CompuServe user ID number and first password. Currently, the package costs \$29.95. If you use someone else's terminal package, you can get the CompuServe package from Radio Shack, sans software, for \$19.95.

Both packages give you the same CompuServe options and information. Along with your password and ID number, you get a brief instruction/introduction booklet to the CompuServe network, listing some of the services available, the CompuServe phone number network, instructions on how to sign on, and one hour of connect-time to CompuServe. At the end of the first hour, you're given a choice about how you like to be billed. If you have a Visa or Master Card, you can elect to have your charges billed to your card automatically every month. Otherwise, you will be billed directly. (Late payment will result in being "locked" off CompuServe until your bill

Also included with each package is a Dow Jones password and ID number, with one hour of connect time credited to your account; payment is similar to CompuServe. Dow Jones puts you on

Wall Street, at the stock exchange, with only a 15 minute delay from the floor trade (to protect stock brokers, who get the information without a delay). You also have access to megabytes of information about the stocks, their past records, and the issuing companies.

Before calling any CIS number, make sure your modem is correctly set (on originate, and at full duplex). Make sure the software is set for 300 baud, sevenbit words, even parity, and one stop bit (you can also use eight-bit word length, no parity, and one stop bit).

When you first phone CompuServe, you must send a Control C command to the system. How to do this is explained in your terminal software instructions; it is usually done by holding the Down-Arrow key down while pressing the C key. The Control C command (CTRL C) is used by CompuServe to determine the baud rate your computer is transmitting (it's possible to tie on at 1200 baud with the proper modem and phone connection). Next you're prompted to enter your ID number, then your password.

With these formalities finished, you're on line. On your first call, you'll be requested to answer a few questions and to return the application in your Compu-Serve package. Then you'll be ready to use the system.

CompuServe is a menu-driven system, and you start with page one (CIS-1, see Figure 1). As you can see, the display is 16 lines by 32 columns, an exact match for the Color Computer! This is the way the entire service is set up, in *pages* of 16 lines by 32 columns. Some areas deviate from this standard, but I'll warn you about them as we go along.

Paging Along

You travel from one menu in the system to another until you reach the information or service for which you're searching. You can also use specific commands to maneuver through the system without bothering to use the menus. This is faster, but requires some skill, as it's easy to get lost.

The commands for this direct maneuvering are simple: T returns you to the top of the CompuServe network, page CIS-1; M moves you to the previous menu; F moves you forward one page; B moves you back one page; H gets you helpful information; R resends the current page; GOXXX goes directly to the area specified by XXX; EXI exits the videotex area; OFF or BYE immediately logs you off the system and disconnects the phone line. There are other commands, but the instruction booklet explains them all, so I've only mentioned the most commonly used commands.

To use these commands you must be at a CompuServe prompt character!. When you're at this prompt, you can move anywhere in the system with the appropriate command. Pressing the Enter key without giving a command will move you to the next page in the series. If you're at the last page in a particular section, Enter will return to the menu for that section. If you want the information flow to stop for a moment, press CTRL-P. To restart it, press CTRL-Q.

DEFALT

One of the first things you'll want to do on the service is customize your termi-

Figure 1. Page 1 Display: CIS-1

COMPUSERVE

PAGE CIS-1

COMPUSERVE INFORMATION SERVICE

- 1. HOME SERVICES
- 2. BUSINESS & FINANCIAL
- 3. PERSONAL COMPUTING
- 4. SERVICES FOR PROFESSIONALS
- 5. USER INFORMATION
- 6. INDEX

ENTER YOUR SELECTION NUMBER, OR H FOR MORE INFORMATION.

!

nal connection. When you first sign on, CompuServe doesn't know what type of computer you have, so it assigns you the category of "Other." This initial mode locks you into uppercase-only transmission and reception. If you have either of the lowercase hardware modifications (LCA-47 or Lowerkit II) in your Color Computer, or if your terminal software gives you lowercase capability, you'll want to change the terminal defaults to let you receive and transmit lowercase, as well as reset your screen width and other variables. You can do this by typing GO CIS9, or following the menus. The menu path is: option 5 of CIS1, then option 4 of CIS4.

This section of CompuServe is called DEFALT, and you use it to customize your terminal to CompuServe. The instructions found here are good, but to read them all takes 42 pages (or screens of information) and about 15 minutes. Using DEFALT you can set your terminal type, Logon actions, printer delays, and terminal parameters.

CompuServe supports four types of terminals: Videotex, TRS-80 Model I/III, Teleray, and VT-100. The Videotex terminal mode tells CompuServe to transmit information in lines of up to 32 characters. Most Color Computer owners will use this mode. The Model I/III mode sets the information to 64 characters per line, which is best for that size of screen display. If you have one of the terminal packages for your Color Computer which lets you use 64 character lines, you can select this option. Teleray and VT-100 are two non-Tandy terminals.

DEFALT option 3 lets you determine what CompuServe does after you've logged onto the system. Normally you would go straight to CIS-1, unless you have EMAIL waiting, in which case you are told you have a message. Using the Logon option: you can tell CompuServe to inform you of waiting EMAIL, and then proceed to the EMAIL section of CompuServe to read it; set CompuServe to expert user mode (not recommended for beginners), which shortens the length of messages and prompts sent to you by CompuServe; you can have CompuServe drop you into your CompuServe programming area and automatically execute a program, such as a program you wrote that takes you straight to Micro-Quote for stock market information to down-load information; or, you can have CompuServe simply drop you into your programming area or one of the other special services available.

If you're using a printer attached to your Color Computer (via the ROM port, usually) you can specify a printer delay, with option 4 for execution after a carriage return or line feed, so your printer won't miss characters sent by Compu-Serve while the printhead is traveling back to the left margin (these delays won't function if you're accessing CompuServe through a Tymnet phone number).

Finally, with option 5, you can set terminal parameters. These parameters are line width; page size (number of lines that fit on a screen); form feeds (whether or not your terminal responds to the form feed command by clearing the screen and homing the cursor; if it doesn't, a series of print commands are issued to simulate a form feed); horizontal tabs (similar in concept to form feeds), upper- and lowercase setting; capitals lock; line feeds (whether or not each line of text needs a line feed after it); parity; and blank line control.

The upper- and lowercase setting tells CompuServe if your terminal can accept both upper- and lowercase characters, while the capitals lock forces Compu-Serve to translate all your transmitted characters into uppercase only. Turning the capitals lock off means you send in lowercase except when you're holding down the shift key. You'll notice that some people prefer to send in all lowercase, others in all uppercase. Few people mix cases, which makes sense, because most Color Computer owners use unmodified computers, or terminal packages that don't support real uppercase and lowercase characters, using reverse video instead.

Parity control should be explained in your terminal manual. Blank lines determine if CompuServe sends blank lines. If you're echoing information to a printer, suppressing blank lines saves paper. (I figure every blank line not sent is one character less that I have to pay for — sets of two or three line feeds mount up to wasted connection time.)

When you're in DEFALT, I'd suggest selecting the videotex terminal support, announce EMAIL and then reading it, full prompts, and no blank lines.

Exploring

With your terminal requirements set up, you're ready to start exploring the service. But before you start, you might want to see if there's a CompuServe number you can use that's closer to your area, if you're not using a local CompuServe number. To do this, examine the CompuServe telephone number database.

From the ! prompt, type cis-177 (menu path: CIS-1, option 5; CIS-4, option 8). In the phone database you can search for

telephone numbers by area code, or by US state or Canadian province two letter codes (option 3 is for 300 baud numbers, option 4 is for 1200 baud numbers). If you prefer, you can get all the numbers listed instead of only the state or area code numbers (option 5 for 300 baud, option 6 for 1200). If you're not sure of the abbreviation for your state or province, options 7 and 8 list the codes used by CompuServe.

The lists are very comprehensive, much more so than the list in the Videotex package. The database lists are also updated frequently, so you might find it prudent to check this section periodically.

SIGnificant Information

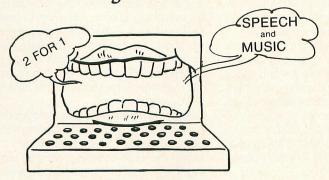
Now you'll want to meet some of your fellow Color Computer owners. To do this, you need to get to the Color Computer Special Interest Group. You can get there directly by typing GO PCS-126, or by following the menus: CIS-1, option 3; PCS-1, option 5; and finally CS-50, option 7. In the SIG sections you have many options to make it quick and easy for you to maneuver among the many messages.

CompuServe has many different SIGs; there are SIGs for CP/M users (an operating system for Z-80 and 8080-based computers), Heath computers, Apple computers, RCA microcomputers, Panasonic computers, programmers, authors, telecommunications, and about 13 other areas of interest, including one for Color Computer owners. In the SIG areas, in general, you have many options available to make it quick and easy to maneuver among the many messages and databases available.

When you enter your selected SIG. you'll be greeted by the SIG system. If this is your first time on this SIG, you'll be asked for your name and if you want to join. Some SIGs restrict the activity of non-members, some even charge a membership fee. Both of these options are exercised by the person controlling the SIG; CompuServe itself has no control over memberships or their charges. The person controlling the SIG is called the Sysop, short for System Operator. If the Sysop has chosen to restrict membership or charge for access to the SIG, or both, you'll be informed at this stage. The Color Computer Sysop has decided not to restrict membership, or charge for

After this greeting, you'll be given a few statistics (your caller number and the number of messages in the system), any general interest bulletins will be listed, and the SIG main menu will be displayed

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4 Notes produced simultaneously.
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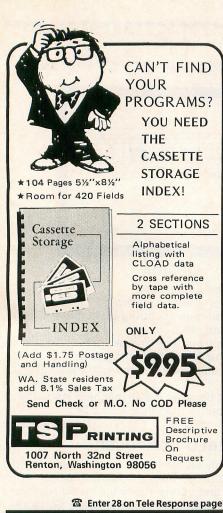
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(see Figure 2, a print out from one of my SIG sign ons). If you've been on the system before and joined the SIG, you'll be told the last date and time you were on the system (a little trap to let you know if someone has been using your ID and password without your permission).

As you can see from Figure 2, this is one area of CompuServe that isn't divided into 16-line pages. Messages and bulletins are sent to your computer in their entirety, no matter what their length. Since this would cause a problem if you're a slow reader or you want to study some information, you can stop the scrolling of information by pressing Control-P (CTRL-P). To Resume, press CTRL-Q.

The function menu in Figure 2 doesn't have two options listed: "4 (RM) Read waiting messages," and "8 (MI) How to join this SIG." Number four wasn't displayed because I didn't have any messages waiting for me, and number eight wasn't listed because I've already joined the SIG. Number eight is used by the SIGs that charge, so non-members can join after looking through the unrestricted portions of the SIG.

SIGs are divided into three sections: the bulletin board, the database, and conferencing. The first five options listed in the main menu pertain to the bulletin board, where you can read messages left by other users on the SIG. Most of the messages are requests for help and their answers or other people's comments on the message. Sometimes these question and answer/comment exchanges can last for months, and cover hundreds of separate messages. Other messages are gossip about the hardware, software, and rumored developments. With the Color Computer SIG, the only restriction is that the messages have something to do with the Color Computer.

Reading messages is easy: select menu option 2, select a message starting number (if you don't want to start with the oldest message on line), and start reading. The format of the messages is always the same. The first line of the message tells you the sequence number of the message, and the categorical section of the message. There are currently five categories supported in the Color Computer SIG: General Interest, Color Computer Hardware, Color Computer Software, the Musical Color Computer, Private Classifieds, and Program Exchange. When you tie on to this SIG for the first time, or if you want to see if any new categories have been added, you can type ss at the : (colon) prompt and the active categories to which you have access, and their names, will be displayed. This is especially useful when exploring a new



Figure 2. SIG Sign-On, Bulletin, and Main Menu

Welcome to * The Color SIG *, V.1A(53) Name: Terry Kepner 70615,1357 Last on: 27-Jun-83 21:56:52 High msg#: 29103 You are user number 79102 System Contains messages 29217 to 29639 Brief Bulletin: ** 7/4/83 **

Hope everyone had a super holiday!

Want to cut down on unnecessary time on the SIG?

You can change from the "menu" system to the expert command mode by using the "OPTIONS" selection on the menu.

Then, instead of seeing the menu each time, and after reading every message, you'll be presented with a function prompt, where you enter a one or two letter command.

Take a look at the instructions to see most of the commands..enter "I" at the SIG Main Menu.

And remember you can change your line length and name, too, by using the options program.

Make the SIG work for you the way vou want it to!

Enter blank line for Menu:

*The Color SIG * Function Menu:

1(L) Leave a message

1(R) Read messages

3(RN) Read new messages

5(B) Read bulletins

6(ON) Online conference

9(OP) Change your SIG options

Exit from this SIG 0(E)

Enter selection or H for help:

SIG. There are a maximum of eleven sections available in any SIG (0 – 10).

Using the extended commands available (Table 1), you can set the system to send to you only those messages having to do with a specific category, so you won't waste time reading messages about hardware when you're looking for

software. More on those commands later.

The next two lines give the subject, date, and time of the message. The subject is a short header typed in by the person leaving the message. If the message is a reply to a previous message, that message's number is referenced and its

mo

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Tenter 30 on Tele Response page

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Table 1. Retrieve, Scan, and Quick Scan Instructions

SIG Retrieve Commands

R Read messages. You'll be prompted for <F>orward, <R>everse, or <S>elective, and then for the starting number.

RF# Retrieve messages in ascending serial order. If number is specified, start with that message.

RI# Read individual message, you must specify a number.RM Read messages marked by the SM command (below).

RN Read messages left since you were last on-line.

RR# Read messages in descending serial order. If a number is specified, start with that number.

RS Read selective messages by searching Subject, To, or From message headers.

SN Display the section numbers you have access to, and their names

SS# Set message retrieval to specified section number only.

SSALL Restore retrieval to include all available sections.

Options Available while retrieving messages

C or Enter Go to next message.

D Delete message sent or received by you.

NS No stop between messages, except ones to or from you. Use CTRL-P to return to function menu, CTRL-O to skip to next message, CTRL-C to abort listing and allow immediate exit from system, CTRL-S to pause listing, CTRL-Q to resume listing, and CTRL- A to stop output at the end of the current display line.

RE Reply to current message.

RP Read previous message, if this is a reply.

RR Read reply to this message, if there is one.

RT Read messages, automatically reading replies to messages that have them.

T Return to SIG Main Menu.

NOTE: RE, RP, RR, and RT resume reading messages at position where thread was first picked up.

SIG Scan Commands

S# Scans messages, displaying header information only. You can specify a starting number. You'll be asked for <F>orward or <R>everse scan.

SD# Forward scan of headers, with option to read each message. Starting number optional.

SF# Scan messages in ascending serial order. Starting number optional.

SR# Reverse order scan. Starting number optional

SM# Scan message headers, and let you mark them for retrieval using RM command. SMF or SMR can be used for forward or reverse scan.

SIG Quick Scan Commands

QS List message numbers, subjects, section information, and number of replies to each message.

number of replies to each message.

QS# Provide information for the specified message only.
QS NEW Restrict information to that message's thread or topic only.
Information about messages left on system since the last time you were on line.

ALL May be appended to any of the QS commands to include individual message numbers and the senders' names to the

information displayed.

header is used. The subject line can be up to 24 characters in length.

After this comes a line with the name and user ID number of the message sender, and a line with the name and user ID number of the person to whom the message is addressed. Both lines have a maximum length of 24 characters.

Finally comes the message itself, which has a maximum length of either 96 lines or 2500 characters. After the message is listed, the bulletin board system lists the numbers of any replies to the message. If this message is a reply, the message number it is a reply to is listed.

The system now lists three possible choices of action in a Read Option Menu:
1) you can read the next message by typing a 1, a C, or just pressing the Enter key;
2) you can reply to the current message by typing 2 or RE; or 3) return to the function menu by typing 3 or T. If you sent this message, or this message is a reply to a message you left, you have another choice displayed; 4) delete the message by pressing 4 or D.

However, these are not your only choices. If the current message is a reply to a previous message, you can type RP and the previous message will be displayed. If the BBS says that there's a reply to the current message, you can type RR to read the reply, skipping the intervening messages. This is known as following a conversation thread. When the end of the thread is reached, either by reaching the beginning of the series with RP or by reading the last of the replies, you're returned automatically to your place in the message system. Thus, if the current message is number 29990 and there are replies at 30000, 30100, and 30120, you can use the RR command to read the replies, sequentially, and you'll return to Read Option Menu in front of message 29991 after reading the last reply.

A cousin to the RR message is RT, which is a general command to automatically read replies to messages whenever they're found, rather than waiting for the RR command to begin to read a specific thread. That is, RR will make the BBS read all the replies to the message you were reading when you issued the command. After returning to the sequence, if another message is discovered which has replies, you would have to reissue the RR command. But if you always want threaded messages followed in sequence, RT would "lock on" the RR command, where applicable.

The last command available is NS, nonstop. When you give this command, the messages will start scrolling, without stopping between messages, unless you reach a message you sent, or a reply to a message you sent is reached. To stop this continuous scroll and return to the function menu, press CTRL-P. To pause the scroll, press CTRL-S, to restart it use CTRL-Q.

Sometimes you'll realize a message isn't what you thought it was, and you want to skip it. Pressing CTRL-0 causes the BBS to stop output of the current message and skip to the Read Option Menu in front of the next message.

Now let's go back to the Main Function Menu again. Normally when you start scanning messages, you start at one end and go towards the other, but sometimes you don't have the time to read all the messages on the system, or you're only interested in one topic and want to read only about it. This is where the section numbers come in handy. If you type ss#, where # is one of the section numbers, you can restrict the BBS to displaying only messages with that section number. To restore all the sections for display, just enter SSALL at the Function Menu prompt.

To save time and skip the BBS prompts of starting number, you can type RF #, where RF retrieves numbers in ascending serial order, starting from the number you specify. If you want to start at the end and serially descend through the message file, use RR #. Specific messages can be retrieved with the command RI #. If you only want new messages use RN. You can also select messages according to the Subject, To, or From headers by using the RS command. For example, you could restrict retrieval to only those messages addressed to all users, or restricted to the subject of Help!

Still another method of saving time is to scan only the headers of the messages, selecting those you want to read as you reach them, or marking them for reading at a later time. These commands are: s #, scan starting from the number you give; SD #, scan forward, with the option of reading the message or continuing to the next header; sf #, scan headers in ascending serial order from the number indicated; SR #, scan in reverse serial order from the number you specify; sm #, scan headers and let you mark them for reading using the RM command; SMF #, forward marked scan; and SMR #, reverse marked scan.

Saving even more time is the Qs, quick scan command, which lists the messages' numbers, subjects, section information, and number of replies to the message. If you want you can specify only information about a specific message by typing Qs #, a handy way to find out how long the conversation thread is for that message. For a more general approach, Qs# ONLY restricts the quick scan to the specified message number's topic

or given thread of conversation. If you're interested only in new messages since your last time on line, use QS NEW. By appending the command ALL to any of the QS commands, you can have the BBS list individual message numbers and the name of the sender with the rest of the quick scan information.

Quick Scan is a convenient method of sorting out the different conversation threads in the BBS with a minimum of wasted time and space.

If the Color SIG interests you, be sure to read the column by Wayne Day, Color Sysop, beginning in **The Color Computer Magazine** within the next few months. Also, you might want to order the SIG instruction manual once you're a registered CompuServe member (\$3.95) — use CIS option 3.

Passwords

CompuServe suggests that all users periodically change their system password to prevent others from "discovering" it and running up illegitimate charges. I suggest changing your password every tenth access, or monthly, whichever occurs first.

To change your password, type GO CIS175 from any CIS videotex prompt, or use the menu path: CIS-1, option 5; then CIS-4, option 5.

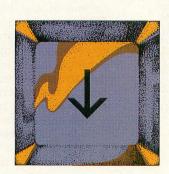
CompuServe will ask you for your old password. Type it in. It won't be displayed as you type it, in case you're not in a private room and someone may be watching you. Next you'll be prompted for the new password. Be careful, this time what you type will be displayed. The new password must be at least eight characters in length, and one of them must be a nonalphabetic character. The maximum length is 24 characters.

Now for the tricky part. If you have a terminal program which responds to the BELL command, your computer will "beep" four times. Then three lines of apparent garbage will appear. These are the hash-codes for your password. Even if someone has your password's hashcode, it should be impossible for them to figure out your password. And Compu-Serve doesn't respond directly to the hash-codes, only to the password which generates them. CompuServe doesn't even store passwords in its memory banks, only the hash-code generated by the password. This is a security measure to prevent an employee of the CIS from divulging a password to someone else, either on purpose or by accident.

The only way someone can find your password is by getting it from you, or by figuring it out based on what they know

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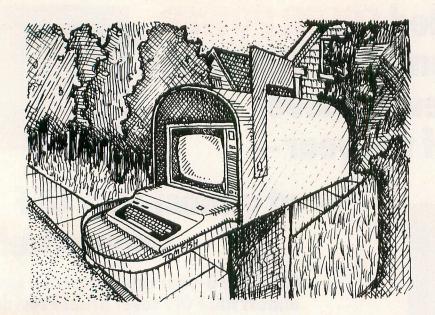
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HS84



about you (a known trekkie would be illadvised to use SPOCK&KIRK or STAR* TREK as a password, for example).

After your new password's hash-code is computed, it's compared with the other hash-codes in memory. If the hash-code isn't already in memory, it's accepted. If the hash-code is a duplicate of one in memory, an error code will be displayed and you'll be prompted for a new password. This will repeat until a valid password is found.

When a valid password is found, CompuServe prompts you to enter the new password again, to make sure that what it received is what you sent. Don't do what I did: I thought the prompt was asking for another password, instead of asking me to retype the password for transmission verification. The verification password is encoded into a hash-code and compared with the previous hash-code. Your computer will beep four times again and three lines of apparent garbage will be displayed. Any errors will be reported to you.

When the password change is successful, you'll be returned to CIS-4. If by chance you should lose or forget your password, call CompuServe on their 800 number and describe the problem. A new password will be generated and sent to you by mail, in one of those special envelopes which are presealed with carbon paper inside. This ensures that no one sees the new password, since it's typed on the outside of the envelope, without a ribbon (the carbon inside the envelope makes it appear only on the paper inside, hence no one can see the password without opening the envelope). The mail takes about three or four days to get the password to you. It's a little inconvenient, but you shouldn't have forgotten your password!

Leaving Messages

Back to the SIGs. Messages can be addressed to the Sysop, and many times the Sysop will volunteer information, either as sign-on bulletins or in messages.

As you're reading the various messages on the system, you'll probably decide you want to reply to a message, ask for clarification of a problem, comment on a problem, or leave a request for help of your own.

If you've decided to leave a new message, select option 1 of the Function Menu. If you're reading messages and you see one to which you want to leave a reply, type RE at the Read Option Menu.

You'll now be asked for the name or user ID number of the person to whom you want the message sent. The Sysop can be addressed as Sysop as well as his name and user ID number. Next, the number one will appear with a colon beside it (1:). Type in the first line of your message (the SIGs use a simple line editor for creating messages).

When you reach your terminal's screen width (as set in DEFALT of CIS-4), the input line is terminated and the next line number appears (2:). This repeats until you finish with your message. When you're finished, press CTRL-Z to tell CompuServe that the message is complete, or leave a blank line by pressing Enter.

A menu of six options will be listed. The first option stores your message with the other messages in the SIG system. The second option lists your message on your screen, so you can see how it looks and check for errors. The third and fourth options (replace a line and delete a line) let you correct any errors you find. The fifth (continue entering text) lets you add to the message should you discover you forgot something or want to add a post-

script. And the sixth, abort, deletes the message and returns you to the function menu (or the message file if you were reading it when you decided to respond to a message).

The numbers printed while you were entering text were for your editing use only, and the line lengths used were for your terminal only. The message will be reformatted, when it's read, to match the reader's terminal parameters.

You do have limited text formatting commands available for your message. Since your message will be reformatted by CompuServe for the reader's screen, you need some way to prevent the service from combining paragraphs. Similarly, you sometimes want to indent sections of text, starting them at a display column other than zero.

Both options are supported by CompuServe. The . (period) command, as the first character of a line, forces CompuServe to start the text that follows on a new line, that is, the text following the command isn't concatenated to the previous line. The period doesn't have to be on a separate line when you're composing the message; you can type . This will start on a new display line. If you want to skip a line when the message is sent to the recipient's display, put the command on a line by itself.

The .># command is used to move the margin to the right the number of columns specified by the number after the right caret (#). To set the margin back to column zero, use .>0. All lines after the .># command will be indented that number of spaces, regardless of the length of the lines in the original message. You can temporarily set the margin to zero, until the next period command is reached, by using the < command. When this command is reached, after a previous .># command, the margin will go to column zero until a period command is reached, which will start indenting all following text (Table 2).

♦ more

Table 2. Message Formatting Commands

Command Result

- . Force the following text to start on a new line.
- .># Force margin to start at column specified by #. All subsequent lines will be indented to this column on the recipient's display.
- .< Temporarily forces subsequent lines to start printing at column zero, until the period command is reached.
- .>0 Cancels the last .># command issued, and starts printing at column zero on recipient's display.

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TELEWRITER-64

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64 COLUMNS (AND 85!)

Besides the original 51 column screen, Telewriter-64 now gives you 2 additional highdensity displays: 64 × 24 and 85 × 24!! Both high density modes provide all the standard Telewriter editing capabilities, and you can switch instantly to any of the 3 formats with a single control key command.

The 51×24 display is clear and crisp on the screen. The two high density modes are more crowded and less easily readable, but they are perfect for showing you the exact layout of your printed page, all on the screen at one time. Compare this with cumbersome "windows" that show you only fragments at a time and don't even allow editing.

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Dynamic (embedded) format controls for: top, bottom, and left margins; line length, lines per page, line spacing, new page, change page numbering, conditional new page, enable/disable justification.

Menu-driven control of these parameters, as well as: pause at page bottom, page numbering, baud rate (so you can run your printer at top speed), and Epson font. "Typewriter" feature sends typed lines directly to your printer, and Direct mode sends control codes right from the keyboard. Special Epson driver simplifies use with MX-80.

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File and I/O Features: ASCII format files create and edit BASIC, Assembly, Pascal, and C programs, Smart Terminal files (for uploading or downloading), even text files from other word processors. Compatible with spelling checkers (like Spell 'n Fix).

Cassette verify command for sure saves. Cassette autoretry means you type a load command only once no matter where you are in the tape.

Read in, save, partial save, and append files with disk and/or cassette. For disk: print directory with free space to screen or printer, kill and rename files, set default drive. Easily customized to the number of drives in the system.

Editing features: Fast, full-screen editor with wordwrap, block copy, block move, block delete, line delete, global search and replace (or delete), wild card search, fast auto-repeat cursor, fast scrolling, cursor up, down, right, left, begin line, end line, top of text, bottom of text; page forward, page backward, align text, tabs, choice of buff or green background, complete error protection, line counter, word counter, space left, current file name, default drive in effect, set line length on screen.

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> — The RAINBOW, Jan. 1982

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Table 3. Message Editing Commands

Command Definition

Display Commands

- L List your message, unformatted.
- L# List the line specified, unformatted.
- **Lx,y** List the message, starting at Line x and stopping at Line y, unformatted.
- P List the message, formatted the way the reader will see it.
- **P#** List the message, formatted, with the line length specified.

Edit Commands

- I# Insert a line before the line number specified.
- D# Delete the line number specified.
- **E#** Edit the line number selected, you'll be prompted for the word or phrase you want removed, and for the replacement word or phrase.
- R# Replace the specified line number.
- C Continue composing your message after the last line previously entered.

Exit Commands

- A Abort and completely cancel the mes-
- Save the message in the message file, and return to the function menu, or to reading the messages.
- **S#** If section numbers are implemented (they are in Color Computer SIG), then the message will be saved in the section specified (0 10).
- **SP#** Add a P to the S or S# commands if you want the message to be private.

Like so many of the menus used in CompuServe, the options listed in the Leave Message Options Menu aren't the only ones available. When listing your message, you can specify the line you want listed, a range of lines, or the entire message. These commands (L, L#, and L x,y, where x and y and the beginning and ending line numbers of the lines you want listed) show your message the way you typed it, line numbers and formatting commands. If you want to see how the finished message looks to a recipient you can use the P command. If you want to see how it looks with a column count different from your terminal's setting, you can specify a number after P that CompuServe will use as characters per line limit when displaying the message.

The editing commands are listed in Table 3. The only clarification needed is for the E, edit command. You can enter it as E#Original word or phrase; replacement word or phrase. After the replacement, the new line will be displayed and you'll be asked for confirmation of the change.

Conferences

The Sysop also arranges special conference discussions, where many people

are on line simultaneously. These discussions are conducted in real-time: the user who types first gets displayed first, although most such conferences have rules of procedure.

Users can request the Sysop to arrange for special guest speakers to appear on the conference line at specific dates and times. Usually such special events are announced in the SIG sign-on bulletins.

The conference line is a great way to "meet" people and discuss problems you may have with software, hardware, or logic, without having a day to day time lag between each message. The special guest events are quite popular, especially when the guests are Ed Juge, Jake Commander, and other well-known Color Computer personalities.

The conference system is divided into 22 channels, paired up with the category sections of the message system. Section zero has conference channels 30 and 31; section one has channels one and eleven; section two has two and twelve; and so forth up to section 10 with channels ten and twenty. If you have access to a category section, you also have access to its conference channels.

The commands for the conference are simple; you can select it from the Function Menu (option 6), or by typing co.

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conference system, type /STA. This command will list only the people on the channels to which you're tuned (unless you specified a section number, you're automatically put in section zero, general interest, channel 30). If you're a nonmember on a board with restrictions for nonmembers, only the unrestricted sections' channels will be available to you. That is, if section 2 is restricted to members only, you won't be allowed to conference on channels 2 and 12 unless you're a member.

If you want to change channels, use the ITUN command. You can "talk" on one channel while monitoring (listening to) another by using the /MON# command. To turn off the monitoring, use /UNM#, where # is the channel number. If you get confused, use the /HEL command for additional assistance. When you're finished with the conference mode and want to return to the rest of the SIG, type /EXIT. The section numbers, their channels, and the conference commands are summarized in Table 4.

Editor's Note: Terry's helpful hints will continue periodically in a new column, "CompuServe Connection."

Tak	ole 4. Conference Mode Particulars
Section (Conference Channels 30,31
	1,11
2	2,12
3	3,13
3 4	4,14
5	5,15
	Section
	Conference Channels
6 7	6,16
8	7,17 8,18
9	9,19
10	10,20
Command	Purpose
/EXIT	Exit conference mode and return to SIG.
/STA	How many users are on the different channels.
/TUN	Change channels.
/MON#	Monitor an additional channel.
/UNM #	Stop monitoring a channel.
/HEL	Get help for this mode.

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Fifteen Database Managers

Finally: All you wanted to know about DBMs but were afraid to ask.

By Scott Norman

THE FIFTEEN DATABASE managers for the Color Computer that I reviewed range from inexpensive "electronic notebooks" for jotting down lists of things to do, to potent business-oriented packages. Database management products seem to be announced every day, so I can guarantee that this review is incomplete, but at least everything from the very simple to the very complex is represented.

Defining Terms

Although this isn't a tutorial on the principles of database management, a few definitions are in order. For our purposes, a DBM is a program that can manipulate information in a file by adding, changing, and deleting individual items, and that can search, sort, and list all or part of the file. The totality of information about any entry in the file is called a *record*, and each distinct piece of information is called a *field*. Working back up the ladder:

- A *field* is a single piece of information (address, telephone number).
- A record is a set of related fields (address and telephone number for one person).
- A *file* is a set of related records (an entire directory).

Most of the programs I'll review are not database managers at all, but file managers. They only operate on one file at a time; a true database manager can work with several, picking information from here and there to create a new file. I won't refer to this distinction in most of what follows, however.

Major features of the DBMs are summarized in Table 1. Read the individual reviews for more details; these capsule commentaries will give you a feel for the programs. You'll find them listed in alphabetical order.

As always, it's a good idea to check with the vendor before ordering, to verify the current price and shipping charges.

How They Stack Up

	C.C. FILE	COLOR DATA ORGANIZER	COLOR FILE	DATA BASE MANAGER	DISK DATA HANDLER	FILESYS
VITAL STATISTICS PRICE CART. DISK TAPE MIN. MEMORY, K	\$12.95 T,D 16	\$19.95 \$29.95 T D 16	\$29.95 C 16	\$198 D* 64	\$44.95 \$54.95 D 32 64	\$9.95 T 32
MAX. CAPACITIES RECORDS FILE CHARACTERS RECORD FIELDS RECORD CHARACTERS FIELD	** 240 NA NA	255 50 4 9 & 16	7 15000/FILE	390 1320 99	500 80 4	
DATA ENTRY DATA TYPES SPEC'D.? ALPHABETIC INTEGER DOLLARS & CENTS OTHER FIXED PT. FLOATING PT. EXPONENTIAL TIME DATE	N	Y X	Y X X	Y	× ×	
RECORD EDITING REVIEW FULL SCREEN ACCESS BY RECORD # ACCESS BY DATA	YNY	N Y N	Y Y N	Y Y Y	Y N Y	N N N
CALCULATION CAPABILITY?	N	N	N	Υ		
SORTING USER-CONTROLLED? NO. OF FIELDS ASCENDING DESCENDING	NA NA NA	Y 1 A	Y	Y 1 A	Y VARIES A,D	Y 1 A
SELECTIONS OF RECORDS SELECTION CAPABILITY COMBINE CRITERIA?	Y N	Y	Y	Y	Y	Y N
REPORT FORMATTING STORE FORMATS? NUMBER TITLES PAGINATION RE-ORDER FIELDS? VARY COL. WIDTHS MULTI -LINE FORMATS TOTAL NUM. COLUMNS SPECIAL "LABEL" FORMAT	N N N N N N N N N N N N N N N N N N N	N 2 N N Y N N N	N (PRINTS SELECTED RECORDS IN THEIR ENTIRETY)	N Y N Y N N Y	Y NA Y N Y N Y	Z
DOCUMENTATION NO. OF PAGES TABLE OF CONTENTS INDEX COMMAND SUMMARY	2 N N	6 N N N	21 Y N N	76 Y N	12 N N N	3 N N N

^{*}FLEX DOS REQUIRED

^{**}LIMITED BY DISK CAPACITY

at a glance

FILMASTR	FLEXI FILER	FURST & RE- PORT WRITER COMBINATION	HOMEBASE	PERSONAFILE	PERSONAL FILE MANAGER	PRO - COLOR - FILE	RMS	TIMS
\$29.95 \$34.95 T D 16	\$64.95 D 32	\$40 \$50 T D	\$75 D 32	\$59.95 D 16	\$17.95 D 32	\$79.95 D 32	\$200 D* 64	\$24.95 T 16
(PER FILE 16/32K) 255 20 9000/24000	** 240 35	MORE COMMITTEE C	DATA TEXT 250 250 255 480 49	540 256 8 256	250 7	** 1010 60	16383 250 50 250	230 8
N	Y X X X	Y X X	Y X X X	N	Z	Y X X X	Y	N
Y N Y	Y N	Y Y N	Y N Y	Y BY SUB. & TAG N	N BY UP TO 3 ID'S	Y Y Y	YNY	N N Y
N	N	N	Υ	N	N	Υ	N	
Y 1 A	Y 1 A,D	Y 1 A	Y 1 A,D	N 1 A	NONE	Y 3 A,D	Y 1 A	Y 3 A
Y	Y	YN	Y	N	N	Y	Y	Y N
N Y Z Y Z Y Y Z	Y 10 Y Y Y Y Y	2 422 42 4 2	Z	PRINTS ONLY THE CURRENT RECORD.	NO PRINT CAPABILITY.	Y 5 Y Y Y Y Y Y Y Y	Y ** Y Y Y Y Y Y Z	N Y Y N N N N
14 Y N Y	34 Y N Y	9 N N N	103 Y N N	28 Y N Y	23 N N N	31 Y N Y	62 Y N N	13 Y N N

C.C. File

Trans Tek 194 Lockwood Lane Bloomington, IL 60108 (312)351-1345 16K

\$12.95 tape or disk

"C.C. File" is the simplest program of the lot. An electronic "memo pad," it accepts records up to 250 characters in length; that's just about its only limitation. Text and numerical fields of any length can be entered in any order, and there are no privileged keywords for searching. Records within a file aren't even required to have the same structure.

As an example, an address book file might include entries with single-line (house number) and multiple-line (apartment number or business name) addresses. In either case, you just enter a record as a single string, with the fields separated by an @ ("at" sign). It isn't even necessary to enter a null line for a nonexistent field in a given record; many of the more highly-structured DBMs force you to do so.

"C.C. File" comes on a cassette with separate ASCII format recordings for tape and disk versions; it's easy to make a tokenized working copy of the one you need. It works reasonably well with cassettes, because the entire data file is resident in memory while you're working with it. In other words, there is no need for random access to a storage medium. That's because there are no options for sorting records or for merging files. The program does feature dynamic storage allocation, though, making the appropriate adjustments for a 16K or a 32K machine.

"C.C. File's" only other feature is the ability to locate and selectively print records. The search key can be any string that unambiguously identifies the desired record. (The Enter key causes the entire file to be printed.)

Although I prize this program because of its lack of rigorous formatting, I can imagine applications in which it would be handy to designate special keywords for a search. That could always be done by setting off the keys with a special symbol. The only symbols reserved for "C.C. File's" own use are the field separator @, and > (greater-than sign), which is used to insert ten blank spaces to format a video or printed listing.

There are also provisions for updating a file by deleting or adding records. The editing commands are essentially the

same as those used in "C.C. Writer" and "C.C. Mailer/Merger," Trans Tek's programs for text processing and mailing label preparation.

"C.C. File" may seem primitive, but in practice it is an extremely useful and friendly program.

Color Data Organizer

Computerware Box 668 Encinitas, CA 92024 (619)436-3512 16K \$19.95 cassette, \$29.95 disk

"Color Data Organizer" is written in Basic. It has both a file sorting capability and a provision for selecting records according to the values of numeric data fields (not according to alphanumeric fields, though). Unfortunately, each record is very limited in structure: two numeric fields, two alphanumeric fields. The numerics may be up to nine digits long (the display switches to scientific notation for larger or smaller numbers), while the alphanumerics are restricted to 16 characters. The program is really intended for 16K computers, lacking any sort of dynamic memory allocation capability that would let it take advantage of additional memory.

Like many other database managers, "Color Data Organizer" guides you along with nested menus; there are three levels of nesting in this program. There really aren't too many selections to be made, but surprisingly enough, you must issue specific commands to open and close files. This is a chore that is normally automated.

Using the main menu, you can select Storage Control, which opens and closes disk file buffers, creates a new file, or prints a directory; File Control, for entering, changing, or deleting data; or Sort-Print. You must work your way back to the main menu before exiting to Basic.

Here is a guick tour through the operation of the disk version of "Color Data Organizer"; if you are unfamiliar with DBMs, this will acquaint you with some typical tasks that the operator must per-

To build a new file, choose the Create option of the second-level Storage Control menu. You are then presented with a third-level menu that asks for the titles to be assigned to the four data fields, numeric columns first; finally, you are asked for a file name. This is written to disk, and the Storage Control menu returns.

To enter data, select the Open option of Storage Control, and you are prompted for the file name. The disk is read and the main menu returns; now select the File Control option. This time there are only three options on the second-level menu: Input, for data entry; Look, for viewing, changing, or deleting alreadystored data; and Return (to the main menu). Before you can call it quits, though, you must still go back to Storage Control to give the Close command.

You can sort a file in ascending order on any field using the Sort option of the Sort-Print menu. The Print option is fairly versatile. First, you are given the choice of printing a 40 column label or an 80

column report.

The label option puts each field on a separate line, in the order required for data entry: both numerics, then both alphabetics, with the title of each field printed at the left.

The 80 column format is more flexible, letting the user specify the order in which fields are to be printed. Now the four fields of each record are printed on a single line, with titles at the top of the printout. You can also select the records to be printed by setting inclusive upper and lower bounds on the data in one of the fields. Finally, you can specify that the data in either of the numeric fields (but not both) be totaled at the bottom of the report.

Although "Color Data Organizer" represents the next step up towards a comprehensive DBM, its data format seems too restricted for general use. I can imagine using it as a sort of lab notebook for technical data, though. Its scientific notation feature might come in handy in such an application. However, it would really be a better program if it included a keyword search capability for selecting individual records from a file.

Color File

Radio Shack One Tandy Center Ft. Worth, TX 76102 16K, ROMpak \$29.95

"Color File" was one of Tandy's first Color Computer programs. It is furnished in a ROMpak, but as it is written in relocatable machine code it can be copied to tape or even to disk. In any case, it uses cassettes for data storage, which slows things down; from the amount of tape used, I assume the files are recorded in ASCII format. The program is supplied with seven predefined file formats: Addresses, Warranties, Home Inventory, Investments, Auto Maintenance, Medical History, and Resume/Vita. You can define your own file structures as well.

'Color File" has a fairly complete set of commands for ordering and selecting records, and for printing the ones selected. On-screen prompts keep you pretty well informed of where you are in the menu hierarchy, although some of the abbreviations take getting used to.

For example, the first level menu for a file whose structure has already been defined takes the form of a single command line at the bottom of the screen:

ADD CHG DEL SEL ORD TAP PRT

Taken in order, these let you add a record to the file, change the current entry, delete it, select a group of entries for display, put the file in order, save the file to tape, and print selected entries.

Choosing any first level command brings a second level command line into play. Because the ability to select records according to generally useful criteria is one of the strengths of this program, let's look at the SEL commands:

SEL NO! FLD ALL = # < >

SEL is used to actually carry out the selection once a criterion has been specified. NO!, which appears in several other second-level menus, cancels the current option and returns you to the main menu. FLD lets you specify which numbered data field is to be used as the basis for selection. The last four options specify the desired criterion once a target value has been entered in this field. For this purpose, # is to be read as "not equal

In effect, ALL cancels SEL; no data are actually lost when you specify a selection criterion, so you can get the whole database together again by using this option.

The rest of "Color File's" commands work in a similar fashion: a second level menu, often in conjunction with fullscreen editing, carries the real load.

"Color File" makes it fairly simple for the user to carry out all the basic DBM operations. Its advantages lie in its provisions for sorting a database in either ascending or descending order, and for selecting records. The selected records form a separate database that can be resorted, printed out, or used as the basis for further selections. This lets you combine search criteria with ease.

The final touch is the ability to define your own record structure. Despite the genuine usefulness of the standard file formats, there are times when a custom job is called for. With this option, you can specify up to seven fields, and will be asked for the numeric or alphabetic character of each. All "Color File" command options are available when working on user-defined files. This makes "Color File" very useful to the homeowner whose major interests lie elsewhere, but who occasionally wants the computer to do a reliable job of specialized recordkeeping.

Data Base Manager

Universal Data Research Inc. 2457 Wehrle Drive Buffalo, NY 14221 (716)631-301164K, Flex

Two disk modules, \$99 each

By coincidence, the first four programs treated in this review cover the whole range of database management capabilities available to Color Computer users. The first three took us from a free-form memo pad to a modest system for the homeowner. The fourth, UDRI's "Data Base Manager," represents a major leap: it is a business-oriented powerhouse running under the Flex operating system.

The "Data Base Manager" (DBM) is a modular system with which the user can set up a customized menu-driven package for storing, manipulating, and printing data. It is not a stand-alone; instead, it consists of a number of subroutines meant to be incorporated into programs written in Technical Systems Consultants' Extended Basic (one of the most popular Flex-based languages). The subroutines are also compatible with TSC's Basic Precompiler, so they can be used in the code of a precompiler program or called as library routines when precompiling a source code file.

From all this, you can gather that "DBM" is suitable for advanced applications. The end user need not be a computer sophisticate, though; while some programming skill is required to set up a DBM system, the people who finally have to enter data or prepare printed reports can rely on menus to guide them along. The menus are contained in the packaged subroutines.

The various "DBM" routines form an integrated family, bringing many of the benefits of structured programming to Basic. As a result, all programs constructed from "DBM" modules can read

and manipulate the same data files. A standardized data format ensures compatibility; the first 5 - 7 sectors of every file are devoted to headers which specify the number of records in the file, the number of data fields in each record, and the name, nature, and length of each field. The dates of file creation and last update are recorded, and there is a provision for protecting each file with a separate password.

The "DBM" system consists of two disks which can be purchased separately. Part I contains the bare-bones modules that let you create data files, compress and sort them, and print reports using selected fields. In Part II are the routines for printing mailing labels from suitable files, editing file headers, transferring data between files, modifying data using conditional operations, and creating index files

for sorting operations.

The packaged subroutines have nonoverlapping line numbers, and each is referenced in the documentation by its starting line. Thus subroutine DB100 begins at Line 100 and sets the dimensioning statements and On Error statements for a program, DB15000 clears the screen and displays a title message, DB8000 reads and analyzes the header sectors of a data file, etc. Modules are called from an applications program by the appropriate GOTO commands: GOTO 100, GOTO 15000, GOTO 8000 for these exam-

To write a "DBM" program, the user selects the desired routines (as well as any others called from within these routines) and defines variables with the names specified in the documentation. Program code must have line numbers less than 100 (for opening titles only) or between 200 and 6000; these are the only stretches unused by "DBM." The applications program itself will consist largely of a few input routines and subroutine calls. The "DBM" documenta-tion provides examples of a few useful programs: simple data editors for a sequential master file, and a "universal" master menu.

Disk Data Handler

Custom Software Engineering 807 Minutemen Causeway Cocoa Beach, FL 32931 (305)783-1083

32K version, \$44.95; 64K version, \$54.95

In its 64K version, "Disk Data Handler" (DDH) exemplifies the powerful, moderately-priced software now available for Color Computers that have been modified to allow switching over to the all-RAM "Type 1" memory map. It does not require Flex or any other operating system, but runs under the conventional Radio Shack DOS instead. The program is supplied on tape, but this is just for ease of shipment. After the tape is read, a simple conversion puts a working copy on disk.

In concept, "DDH" is similar to many other database managers; that is, it lets the user define the structures of data fields, set up video forms for data entry and editing, read and write files, and sort and select records. However, it has several unique features. One is its general user-friendliness. Most of the nomenclature used on the menus is self-explanatory, and the sorting and selection commands resemble English to an unusual degree.

For example, suppose "DDH" has been used to set up a mailing list (a tried-and-true application), and assume you want to alphabetize the list by sorting according to a field called LASTNAME. To do so, you merely choose the Sort/Select/Report option of the main menu, and then enter the command: SORT LASTNAME. That's all there is to it. Since "DDH" is written in Basic, the sort may take up to 10 seconds for 250 records, but I think you'll agree that the syntax is pretty painless.

This example would put the records in ascending order. The reverse is also possible, using the DSORT command. To add to the program's flexibility, you can specify the number of character positions to be considered in a sorting operation, and can even make the sort extend over more than one field. If the file structure was such that LASTNAME was followed by another field for first names, and if each had a maximum length of 15 characters, then: SORT LASTNAME (1-30) would perform a sort on the longest name in your file. It would put multiple entries for a given last name into ascending order according to the associated first names.

There is a similar syntax for selecting records from a file for further processing. Selection criteria can be expressed in terms of the usual equality and inequality operators, or they can use such concepts as CONTAINS and its converse, NCONTAINS. Thus the command sentence: SELECT LASTNAME CONTAINS NOR would find all mailing list entries for people named Norman, Norton, Snorkel, and so on. Selections can be chained together; combinations like

SELECT LASTNAME = SMITH AND ZIPCODE < 50000 are perfectly acceptable.

This command structure makes "DDH" a real pleasure to use. The syntax for generating reports is similar, and lets you specify one of three output devices: the video screen, the printer, or a disk file. Reports can have multi-line headers and automatic page breaks, as you would expect of a sophisticated system, but there is one oddity. If you want to store predefined report formats for "DDH," you must construct them as auxiliary ASCII files using the Basic interpreter. The syntax is meaningless for Basic, of course. Report format files are meant to be saved on disk and invoked with their own command, FILE, when they are needed.

In the same vein, "DDH" itself will not do computations on numerical fields. Instead it is necessary to write a report out to a disk file and use this as input to a Basic program for computations. This can get a bit involved, because "DDH" writes its data as strings that must then be converted with Basic's VAL function. However, the mathematical portions of the programs are unlikely to be very complicated; normally, only If/Then decisions and simple manipulations of data fields are required. The documentation (a 12page leaflet) gives a fairly clear example in the form of a program for keeping track of the prices of stocks in a personal portfolio.

This mode of operation is actually not far from the one used by our previous review subject, "DBM." The key is the generation of standardized files which can be read by many programs.

To maximize data-storage capacity, "DDH" lets you divide data between a quick file called into RAM from the disk for sorting and selection, and an extended file. The latter resides on disk most of the time, and is not available for sorting or selecting records. Instead, the quick file incorporates the index fields to be used for these operations. If the extended file is used, an additional quick file field is used as a pointer to keep the two files synchronized.

This may sound complex, but in fact "DDH's" documentation makes it fairly simple to set up such double-file systems. The increase in system capacity is significant, too. Because the quick file (the only thing actually rearranged in a sort) can be fairly small, the size of a "DDH" file tends to be set by disk space, rather than by RAM availability. The seven-field mailing list used as an example could be only 382 records long when it was used in its entirety as a quick file. When split into quick and extended files, the "DDH" screen informed me that 1317 records were available for my particular format. Like gas

mileage, the actual numbers will vary.

Because the 64K version of "DDH" can be configured to run on 32K machines, it is probably the one to choose if you have any thoughts of expanding your system in the future. Many of the more advanced report formatting features require 64K.



Circle City Software P.O. Box 30166 Indianapolis, IN 46220 32K

\$9.95 cassette

"Filesys" is a simple DBM, reminiscent of "Color Data Organizer" in many ways. It has a few special features, such as the ability to use either tape or disk for data I/O. This is unique for such an economical program. Rudimentary capabilities for sorting, selective printout of records, and report formatting also exist.

All "Filesys" records must have a prescribed format: a numeric field, two alphabetic fields, and another numeric. Only positive integers are accepted for the numeric fields. The user assigns names to the fields when creating a file, and these names are subsequently used for screen prompts during the data entry and editing phases.

and editing phases. There are several

There are several options for changing an existing file. Instead of adding unlimited data to the end, you may choose to add just one record (the Insert mode) or to change one (the Edit mode). There are commands for moving throughout a file when editing, as well as for specifying which field of a selected record is to be changed.

The program is menu-driven and is generally easy to work with. I did find one lapse, however. If you wish to delete an entire record, you must specify the exact data in each of the four fields. In other words, having entered the offender once, you must enter it all over again to remove it! The manufacturer points out that this protects a file from accidental erasures. True enough, but the process is trickier than need be; the original data are not displayed during the reentry, so you must trust to memory to get things right.

"Filesys" lets you put a file into ascending order according to any one of the four data fields. Like the rest of the program, the sorting routine is written in Basic; it is guite slow.

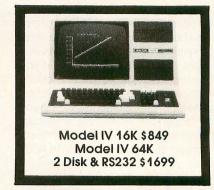
"Filesys'" output can be directed to the screen or to a printer. If the printer is selected but is not on, output defaults to

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the screen. There is no possibility of the program hanging up and losing a file because you forgot to turn on the printer!

Complete or partial printouts can be specified. The latter option lets you select records for output by specifying maximum and minimum values for any one of the data fields. The maximum must actually be one greater than the largest value you want to see, however. Thus, if you were using "Filesys" to keep a phone book or similar directory and wanted a list of names from Jackson to Jones, you might designate Ja as the minimum aceptable value and Jp as the maximum; Jp is "larger" than Jo, in the sense of ASCII codes.

There is no command for searching a file for a keyword. You can narrow the record selection criterion by a suitable choice of maximum and minimum, however. If you wanted to see only the Smith entries in the hypothetical phone directory, you might specify a minimum of smith and a maximum of smiti.

The user has a limited degree of control over the appearance of "Filesys" reports. There is a tabbing command for setting the widths of columns, and an ability to specify one or two lines per printed record.

"Filesys" is clearly a program of modest scope, but it does offer an economi-

cal way for the Color Computer user to acquire some data management capability

Filmastr

The Computer House Box 1051 DuBois, PA 15801 (814)371-4658 16K

\$29.95 tape, \$34.95 disk

"Filmastr" is a robust, user-friendly program. As the price suggests, its capabilities lie somewhere in a broad middle range: it is more potent than "C.C. File" and "Filesys," but less so than "Disk Data Handler" and the higher-priced DBMs.

This program's strong points include the ability to handle up to 20 fields per record with full-screen editing of data, fast machine language sorting and selection routines, and a fairly simple syntax for formatting reports. There is almost always a brief, helpful menu present at the bottom of the screen, too. Most user options are selected by number from these menus.

Data are entered with the aid of userdesigned video forms. Each file may have its own form, with a title that may or may not correspond to that of the file itself. The user supplies the names and lengths of each field, and positions the blank fields on the video display. No distinction is made between alphabetic and numerical data at this point, so it is not necessary to learn any codes to designate what sort of information will be entered into the various fields.

"Filmastr" is a memory-resident system; the entire working file must fit into RAM, with room left over for the necessary rearrangements that take place during a sort. To put this into perspective, a 16K computer will have room for 108 records, each 78 characters long; a 32K machine can hold 305 such records. (Both figures assume a PCLEAR 1 command has been given to minimize the memory reserved for graphics.) Of course, fewer records will fit if you use more of the 255 character positions available.

A convenient feature is the ability to copy identical fields from one record to another during the data entry process. Suppose you are setting up a mailing list file, and want to enter information for the prolific Smith family; once the first record is established, there is no need to retype Smith. Just position "Filmastr's" blinking cursor in the Last Name field, hold the Clear key down, and press

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Enter. The corresponding field of the previous record will be copied.

One possible point of confusion is the use of three different keys — Break, Clear, and Enter — to perform control functions during the data entry and review process. The Break key itself calls up one of two command menus, depending on exactly where you are in the program's operation. It is sometimes necessary to go through an extra cycle of listing a file in order to get to the one desired. On the positive side, nothing short of hitting the Reset button will cause a file to be lost.

Two or more "Filmastr" files with the same structure can be combined into one; the Load command reads from disk or tape without destroying whatever is in memory. Of course, the length of the combined file cannot exceed the limits established by RAM size.

"Filmastr" can sort a file into ascending order according to the entries in any field. The machine language sorting routine will handle 300 records in about five seconds. The usual ASCII ordering conventions are followed.

Records may be selected on the basis of complete or partial matching with a key phrase, and any field may be designated for the comparison. The relational operators <and> may be used, so that the criterion < N applied to a Last Name field would identify everyone whose surname begins with A - M.

Although Boolean operators are not allowed, a sequence of selections can be used to produce the same result. For example, the Boolean process: "Last Name N AND First Name > K" could be duplicated by creating a "Last Name < N" file, and applying the selection "First Name > K" to it.

The records that survive a selection process form a current file that can be listed on the screen, printed, or saved to tape or disk. To recombine records with the file, return to the first menu.

Many small databases contain one or a few columns whose total is important. "Filmastr" has a command, SUM, which gives a screen listing of the total of any designated field. Only numerical entries are considered; if you lack the data for one record, it is acceptable to leave the summation field blank or even to enter a non-numeric character like?

It is not possible to define formats for "Filmastr" reports and store them for instant recall; instead, you must specify which fields are wanted, and in which order, whenever you require printed output. This is true of video displays, as well. It's not hard to do: first, decide whether or not you want field labels to accompany the data, and then use a few simple codes to format the listing. Fields are designated by the ID numbers used on the data entry screen: a colon generates a line feed, and any other character (like a space, or the comma between city and state) is taken literally and printed. Format codes are limited to 31 characters, though, so it really isn't practical to set up

elaborate report headings.
All in all, "Filmastr" is pretty convenient to use. The fast sort/selection routines and the ease of setting up data entry screens are probably its strongest

points.

Flexi Filer

Computerware Box 668 Encinitas, CA 92024 (619)436-3512 32K

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"Flexi Filer" (FF) is actually a set of several Basic programs capable of performing all the functions normally required of a file manager. Its principal features include a flexible report generator, ex-



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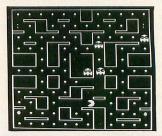


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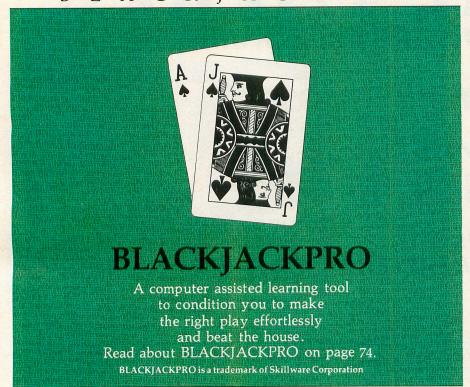
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Tenter 38 on Tele Response page

tremely powerful record selection operations, and some of the best documentation in the business.

Besides the conventional descriptive material, the 31-page manual includes such useful items as a flow chart of the relations between the five menus (including the choices that appear on the menus themselves) and a step-by-step tutorial for creating a data file and for printing labels and reports. There are also printouts from sample files on the program disk, and worksheets for laying out data-entry screens and 80-column and 132-column report formats. Very handy

"FF" is not a memory-resident system, so the size of a file is set by the space available on the disk. The number of records which a disk can hold is:

2300 x Free Grans / Record Size in Characters

This can make for good-size files, but it does have the disadvantage that the disk will be accessed very often in the course of a working session.

Should you have so much data that a single disk is insufficient, you will have to split your file into segments stored on different disks. Unfortunately, "FF" will always treat them as separate files; they cannot be sorted together or used for a common report. This just emphasizes the fact that "FF" is a file manager, rather than a true DBM.

Like many other high-powered systems, "FF" uses video forms to guide the data entry process. Five data types are available: alphanumeric, numeric, fixed numeric (dollars-and-cents format), exponential notation, and dates. These can handle just about any information the user is likely to want, although a little caution is called for; for example, I encountered a bug in using the date format in one particular application. I'll explain it shortly.

To set up a screen format you designate the type of field desired, give it a name and length, and move a cursor to the spot where the field should begin. This is repeated for each field in a record; since there is no auto-repeat function, moving the cursor around can become a little tiresome. When it is time to actually enter data, you see the form for each field in turn. Each record is saved on disk when it is finished.

The previous record also remains in RAM. This can be helpful, because it lets you copy identical fields from one record to the next with a single keystroke. It also gave rise to my problem. It turns out that FF" does not like blank entries for date fields. I tried to set up a sample file using several date fields, some of which were

not to have data in them. I was unable to get away with entering blanks, zeroes, or anything else to denote the lack of information; the program would just go ahead and copy the date from the last record to have that field occupied.

This is admittedly an unlikely situation, but users should be aware of it. A possible fix is to designate partially-populated date fields as alphanumerics; the program is quite content to accept blank

fields of that type.

The same sort of cursor control is used to define label and report formats. (Labels are just reports of up to five lines of 32 characters each.) Data fields can appear in any order, and specific fields can be excluded. "FF" lets the user define up to ten report formats for each file; there can be only one label format, though.

Report definition is a little complicated, but very flexible. There are two stages: first set up a header up to five lines long, then the records area that contains the data. Because reports can be either 80 or 132 columns wide. "FF" resorts to a little trickery to get the format onto the 32-column Color Computer screen. Index lines at the top of the screen define the starting positions of report columns in four-column steps, and dots show the number of four-column increments required for each header item or data field. The headers are entered at report definition time, and need not be the same as the names of the data fields to which they refer.

"FF" reports can contain a lot of information: up to five lines per record. Dashed separator lines can be used to separate records, and numerical columns can be summed and their totals printed at the bottom of the last page of a report. Page numbering is automatic, by the

way.

Álthough rather slow, "FF's" sorting and selection routines are very powerful. Files can be sorted into ascending or descending order according to any field, and you can specify the number of characters to be considered in the alphabetization. You may specify either a disk sort, which actually rearranges records on the disk, or the creation of a Select File. This is just a small file, stored under its own name, containing an ordered list of the numbers of records selected for printing.

"FF" really shines in its ability to select subsets of a file: up to 36 simultaneous criteria can be specified! The full complement of equality and inequality relations are available for ANDing and ORing together. The documentation gives a typical example of culling records out of a large file: find all entries for males who are either 20 or 21 years old, weigh be-

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HS & Co. 111 E. Drake, Suite 7001 Ft. Collins, CO 80525 303-482-0970 tween 50 and 100 kilograms, and live in New York City. One has to get used to the details of the selection syntax to ensure that the Boolean operations are carried out in the correct order, but this doesn't present a real problem.

I was generally impressed with "Flexi Filer." That bug in the date field entry routine was annoying, as was the difficulty I found when trying to insert a new field into an already-defined record format (it can't be done), but these problems must be viewed in context. The system has real strengths when it comes to record selection and report generation. As a final touch, it comes with an autostart utility for setting up a turnkey system. This can be extremely useful where a single data file comes in for heavy use.

FURST and Report Writer

Land Systems P.O. Box 232 Bellbrook, OH 45305 (513)848-8225 16K

FURST: \$25 cassette, \$30 disk Report Writer: \$15 cassette, \$20 disk

"FURST" (File Update and Retrieval System) is unique among moderately-priced managers in that the file creation/maintenance programs are sold separately from the report generator. Because the bare-bones "FURST" package includes a short Basic program for producing a report based on a sample data file, the prospective purchaser can get on the air for a very modest cash outlay. Record and field selection must be done by hand, however, and so the addition of Report Writer soon becomes a necessity if you want to do anything sophisticated.

Although operationally similar, the tape and disk versions of "FURST" are actually quite different in structure. Because tape is not a random-access medium, the cassette program must load all files into RAM before working with them, whereas the disk program can shuffle information back and forth between RAM and disk as often as needed. As usual, this means that the disk version has the edge in capacity.

"FURST" consists of three Basic programs: DEDMAINT, the "Data Element Dictionary" used to define the structure of each record; FURSTUP, the principal file creation/maintenance program; and FILREORG, which actually deletes flagged records from data and index files.

The authors report that bugs in Extended Color Basic's file-handling routines could result in the loss of data if the delete function were incorporated into the body of FURSTUP; hence the separation. (I must report, however, that I have never come across any indication of such difficulties with other programs.)

The files for data and for the sorting indices are created at run time, of course. One of the characteristics of "FURST" is that the user must furnish the names of both files at several points in a typical application. This can be annoying; more complex programs keep track of the index file automatically. Users are well advised to follow the example in the documentation and choose related names for the coupled files.

The gruesomely-named DEDMAINT is the first program the user must deal with; in practice, it provides a rather simple fill-in-the-blanks framework for defining the names, lengths, and other attributes of data fields. Fields are given short descriptive names for later use in sorting and selection, but longer headings may also be associated with each field. These are the titles used when reports are printed.

One welcome feature of all the "FURST" programs comes to light almost immediately: you are given a chance to verify the correctness of every video screen of information before proceed-

The FURSTUP program is used to enter data into a file according to the format established with DEDMAINT. You are asked to specify which DED file will be used, and must then supply names for the data file and for an index file. FURSTUP provides the environment under which records are reviewed, changed, marked for deletion, and so on. Files created here are automatically sorted in ascending order, according to a key field of your choice.

Although specific records may be marked for deletion when you exit FURSTUP, the work file will still be intact. The actual housekeeping functions are performed by FILREORG, the third program in the set. It deletes flagged records from both data and index files, and checks to make certain that both are kept synchronized.

FILREORG can also be used to create additional index files (with their own names) for a given set of data. Each index file allows you to sort the data according to a different key field. One problem is that the additional indices will become obsolete if you add or delete records from the master data file. It is up to the user to recreate index files as necessary, if the program is not to hang up during

subsequent operations.

Version 1 of "Report Writer," the output formatting program, is presently being shipped, with Version 2 promised for the near future. As it stands, "Report Writer" lets the user select the fields to appear in a given report, perform a limited kind of record selection, and specify totals for one or more numeric fields. Record selection is according to an equality criterion: the specified data must appear in the specified field for the record to be printed. Additional and/or capabilities are promised for the update. Within these limitations, "Report Writer" provides a pretty painless way to generate nicely formatted reports with descriptive headings (assuming you remembered to create them under DED

You can do quite a lot with the "FURST/Report Writer" combination. Other file managers are more powerful, and do a better job of keeping track of such things as index files. Nevertheless, this one does succeed in creating an overall impression of user-friendliness at a moderate price.

Homebase

Homebase Computer Systems P.O. Box 3448 Durham, NC 27702 (919)544-5408 32K

\$75 disk

"Homebase" is a big, sprawling program, one of the most powerful non-Flex DBMs I have seen. It actually performs some of the functions of a text processor and a spreadsheet calculator, in addition to handling all the conventional file management chores. In fact, it may fairly be called a true database manager.

"Homebase's" documentation is among the most extensive of any seen in the course of preparing this review, although it does suffer from annoying typos. The program makes use of numerous nested menus, and the manual devotes a separate section to each. There are four major parts to "Homebase": text-file management, data-file management, and utilities for each type of file.

Each text record may be up to 480 characters long: that's 15 of the Color Computer's 32-character lines. Of course, there is a trade-off between the length of a record and the number of records that will fit on a disk. You may enter a record as a solid chunk of text, just as though you were writing straight prose, or you may structure it into lines entered



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in a specific order. This may be the easiest way to ensure that you can later sort and select records.

Text is entered onto a video form under full-screen editing. There are full complements of review and editing features (including global search-and-replace operations), as well as commands for formatting the text for printing.

It is often important to be able to interrogate a single piece of information in a database: i.e., a particular field of a particular record. A nice feature of "Homebase" is its ability to accept the field and record names that uniquely identify a piece of data, in either order. This reinforces the impression that the program exists to help, not hinder, the user.

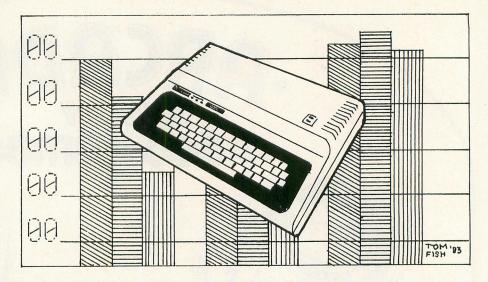
Records can be sorted into either ascending or descending order, a feature one expects of a comprehensive file manager. What is unique about "Homebase" is its ability to perform sorting and selection operations on the basis of either the data in a specified position, or on the name of the records in a file. This is true for general data files, as well as text files. In effect, selection criteria can be ANDed together by being used in sequence. The inverse (Boolean NOT) operation can be invoked by a special Exclude command; the user can elect to exclude any "Homebase" record meeting a selection criterion.

Sorting only involves auxiliary index files, by the way; the main files are not rearranged. This speeds things up, and makes the most efficient use of disk space.

The "Homebase" text utilities allow you to duplicate or merge all or parts of files, create a new empty file using record names belonging to an existing file, back-up disk files onto cassette, and synchronize two files. This feature is what gives "Homebase" its claim to the title of database manager, as opposed to file manager.

The Synchronize option can be used with two files containing different information (fields) about the same entities (record names). If particular records are selected from one file, Synchronize lets you extract the corresponding records from the second one. The files can even differ as to whether they contain text or numerical data.

Which brings us to "Homebase's" formidable capabilities for handling data files. In common with other high-end database managers, this program recognizes several different kinds of data fields: seven in all, plus comment fields for accompanying text. Special formats are reserved for dates and telephone numbers, but of even more importance are the field types named Amount and



Other. Amount fields are always printed in dollars-and-cents format (complete with dollar sign and commas where necessary), while Other fields are straight nine-digit numbers with two places after the decimal point. Only Amount and Other fields can be used in calculations.

"Homebase's" abilities to perform calculations are restricted to carrying out the four basic mathematical operations on complete rows or columns of data. Extended calculations can be handled with the aid of scratchpad fields that can store constants or intermediate results. This represents a useful level of competence, similar to the power of Radio Shack's "Spectaculator."

"Homebase's" editing, sorting, and selection capabilities are similar for data and text files. Most of the file management utilities are similar, too; the exceptions are Summarize and Update, which are unique to data files.

Summarize is used to generate totals for an Amount or Other field. The novelty is that only records having a specified entry in some other key field are considered in the total. If you were to use "Homebase" to keep track of an organization's finances by entering disbursements and income items, the Summarize utility could tell you how much money had been spent on a given item — publicity, for example — over a period of time.

Update has the effect of moving a data field from one file to another, based on matching key fields. Thus the second file can be updated after new information has been entered into the first.

"Homebase" has fairly complete capabilities for report generation. Ample space is provided to insert titles, and there are facilities for automatic pagination and dating. Drawbacks to legibility include fixed field widths and lack of separation between printed fields. The user

can improve matters by selectively deleting fields from a record for reporting purposes, however.

Despite certain flaws in the report formatting routines, and difficulty in sorting fields containing both positive and negative numbers, "Homebase" must be considered an important program. It is complex but not illogical, and deserves the serious consideration of the advanced user.

Personafile

Radio Shack One Tandy Center Fort Worth, TX 76102 16K

\$59.95 disk

Radio Shack's "Personafile," which I reviewed in full in the May, 1983 issue of this magazine, is a straightforward program for keeping track of text information. It is really an electronic notebook file manager; there are no facilities for sorting records or for selecting specific ones for reports, and you cannot perform calculations on numerical data.

Every "Personafile" record is assigned a single 256-character block into which the user enters information. There are no fields as such, and it isn't necessary to maintain the same format for every record.

Records are indexed according to two headers called the Subject and the Tag, which establish a unique identity for information retrieval. This scheme also lets the user keep multiple files on a single disk; the general Subject label plays the role of a file name. The program provides alphabetized listings of all Subjects and Tags on a disk, to help the user find any

to page 75



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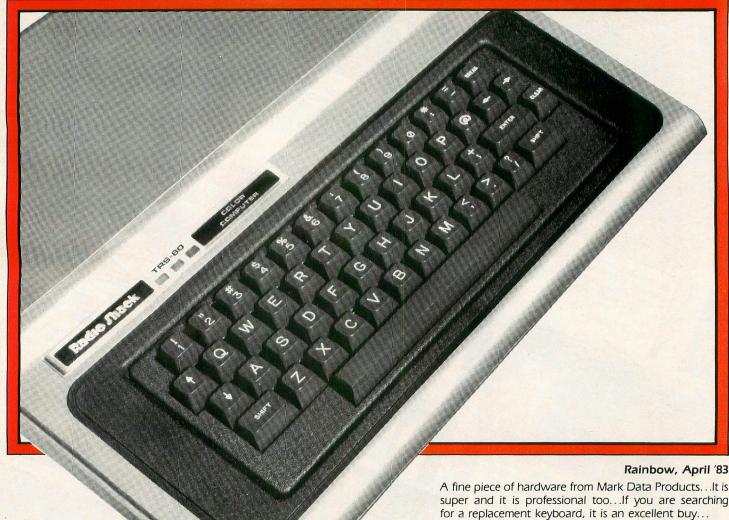


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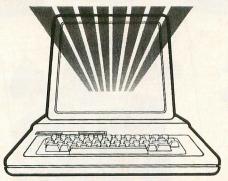
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51 CHARACTER BY 24 LINE DISPLAY

Super Screen is a powerful, machine language program that significantly upgrades the performance and usefulness of 16K or greater, Extended and Disc Basic Color Computers. The standard Color Computer display screen is totally inadequate for serious, personal or business applications so Super Screen replaces it with a brand new, 51 character wide by 24 line screen including full upper and lower case characters. Instead of a confusing checkerboard appearance, you now have true lower case letters along with a screen that is capable of displaying 1224 characters. The difference is startling! Your computer takes on new dimensions and can easily handle lines of text that were simply too long and complex to display on the old screen.

COMBINE TEXT WITH HI-RES GRAPHICS

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PRINT @ IS FULLY IMPLEMENTED

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Super Screen recognizes several special control code characters that allow selection of block or underline, solid or blinking cursor and other functions. You can 'Home up' the cursor or you may erase from the cursor to the end of a line or to the end of the screen just like many other computers. These special codes give you an extra dimension of versatility and convenience that put Super Screen in a class by itself.

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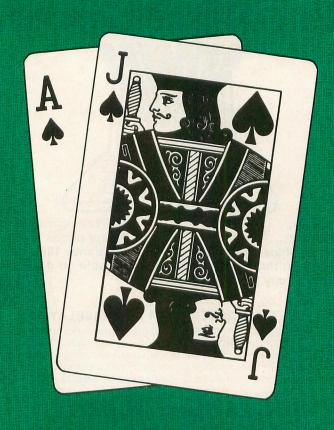


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given piece of information. It is also possible to use All for either of the headers during a search, and the asterisk can be used as a wild card search character.

Every item saved under "Personafile" goes into a single ASCII file called INFO. The name is only assigned by the program for its own use, because the user accesses data by Subject and Tag. These go into another ASCII file, INDEX, which is created and updated along with INFO. INDEX is always kept sorted in alphabetical order. The file entries themselves are not rearranged.

"Personafile's" main menu lets you add to, update, or access a file and to list or change either subjects or tags. Selection of an item brings up a brief secondary menu. As an example, the Add/Update/Access menu asks for Subject and Tag identifiers and either presents the corresponding record (if it exists) or gives you the opportunity to enter new information. It also leads to commands for changing information in an existing record, deleting the record, or printing it. Only the current record, i.e., the one on the screen at any given time, can be printed: there is no provision for automatically printing everything in a file.

"Personafile" deserves high marks for user-friendliness. Help lines are always present, and Help screens are also available for some of the menus. These are rarely needed once you have worked with the program for a short time,

though.

In terms of capabilities, "Personafile" ranks above the lowest-priced programs, but is very far from the sophistication of the comprehensive, high-end file and database managers. That is unfortunate, · in view of its price.

Personal File Manager

Home Information Systems 4006 Ellicott St. Alexandria, VA 22304

\$17.95 disk

Here is another modestly priced package. "Personal File Manager" (PFM) is similar to "Personafile" — intended for the storage of text with no calculation capability. It also lacks any provisions for printing information, which may be a real handicap. Within its limitations, though, it can serve fairly effectively as a repository for household-type facts.

"PFM" employs its own nomenclature: records are called subjects, fields are called data items. Given the program's likely audience, this may not be a bad thing. Purists may insist on proper data processing terminology, but the casual user might be better off using descriptive terms like these.

Subjects are retrieved, edited, etc. according to their recall names, which play the role of "Personafile's" Subject and Tag headings. "PFM" allows as many as three recall names to be specified for each subject. Naturally enough, individual data items are recalled by their data item names. These are entered at the same time as the data items themselves when a subject is first set up. "PFM" goes along with a trend established by other informal file managers: the various subjects need not have the same structure, i.e., the same data item

Because the recall names are so critical, "PFM" can provide the forgetful user with a listing showing one of them for each subject. Similarly, you can get a listing of the data item names for any given

All operations are driven by generous on-screen prompts, making the manual (which is pretty clear itself) almost unnecessary after a short indoctrination period. I did find one thing about the prompts annoying, though: they are poorly formatted. Words run right up to the screen margin and are broken at awkward places, which certainly detracts from any semblance of professionalism. In terms of the amount of information conveyed, though, the prompts are quite good.

The recall names are the first things that must be specified when a new subject is added to a file (the file, that is -"PFM" treats everything on the disk as one file). You are then returned to the main menu and must re-enter the A (Add) command to enter the actual information. This can be done one item at a time, or you can enter several items separated by the special PFM delimiter, \$*. Even if things are entered one at a time, the \$* combination will show up when you later interrogate a subject.

The information retrieval process starts with the main menu's D (display) command, followed by one of the recall names for the subject you want. After verifying that the correct subject has been located (several of them can share a given recall name), you can request the display of a single data item or everything

recorded for the subject.

Like the prompts, the screen listing of a subject's information is crudely formatted. Everything shows up in one block, broken arbitrarily at the end of 32-character lines. Only the \$* markers help you identify individual data items. Once again, the emphasis is on utility, not appearance.

"PFM" has a surprisingly extensive Edit command for revising a subject listing. A simple method of deleting unwanted subjects would be a welcome improvement, as would a Print command. It shouldn't be terribly hard to add either.

As a final comment, I should mention one awkward thing about a particular user response. One option which "PFM" gives you is to review the first line of each subject. The response which ends the review and returns you to the main menu is y, while N brings up the first line of the next subject. I had trouble getting the hang of that. It seemed to me that I was always answering the wrong question.

Pro-Color-File

Derringer Software P.O. Box 5300 Florence, S.C. 29502 (803)665-5676 32K \$79.95 disk

"Pro-Color-File" (PCF) is one of the most powerful DBMs running under the standard Radio Shack DOS. It lets the user perform fairly extensive calculations, and it has a multitude of flexible commands for sorting and selecting records. Up to five report formats can be defined and stored for future recall.

Because the "PCF" system programs create a lot of files for field definitions, data-entry screen set-ups, report formats and titles, and the indices used to sort records for printing, it helps if the data files can be kept on a second disk drive. If you must use a single-drive system, it is probably best to make several copies of "PCF" and resign yourself to using each such disk for only a small number of data files. Keeping the system programs on one disk and the data on another would result in a lot of disk swapping in a onedrive system.

The first information needed by "PCF" is a listing of the data fields to be established for your file, and the length of each. As with many larger programs, it pays to spend a little time planning your database with paper and pencil.

The order in which you define the fields is relatively unimportant, because data can actually be entered in another order and the fields can be scrambled once again when report formats are set up. The important thing at this stage is simply to get a picture of what data you will furnish, and what will have to be calculated by the programs.

"PCF" records can be pretty com-

prehensive; you can define up to four segments of information for each record in a file, and each segment can contain up to 15 fields.

Next, the user defines up to four video screens for data entry. Here, data fields must first be identified as to type: alphanumeric, integer, or decimal number. There is also a fourth type: a field obtained not from data entry, but from computation by user-defined equations. Such fields can also be typed as integers or fixed-point decimal numbers with two decimal places.

Different parts of a screen can be given different background colors to guide the data entry process, and each screen can be protected against unauthorized access by a different password. The cursor is directed to fields requiring user input, skipping over any which will later be filled in by stored equations.

The next step is to set up such equations; up to 14 are permitted for each file. Fields are referred to by the numbers assigned to them during segment definition, while constants are surrounded by quotes.

"PCF's" notation resembles that of Basic in that equations read from left to right (not true in some mainframe programs of my acquaintance!). Parentheses may not be used to group terms together, though, and "PCF" ignores the hierarchy which usually dictates the order in which operations are to be performed.

The Add/Review/Update Records section of "PCF" is used for data entry; it is generously supplied with prompts. After all screen positions accessible to the user have been filled in, the Clear key invokes the equations completing all screens.

As far as updating a file is concerned, you can scan through the data searching for any specified target string, or you can pull a record for examination by specifying its number in one of "PCF's" direct access files. The order in which records were put into the database may have nothing to do with the order in which you want them presented, so "PCF" includes a three-level system for indexing, or sorting, records.

"PCF" also lets you specify whether the indexing is to be applied to all records or to a subset. Allowable selection criteria include a full range of algebraic and logical equalities and inequalities, and two such criteria can be ANDed or ORed together. You may also choose to index all the records and use the selection option later, when printing reports.

"PCF" lets you define up to five reports, each with a unique name and each capable of protection by a different password. Both single- and multi-line

formats are available, and there is complete flexibility concerning the order in which fields are presented. Records may be sorted and selected for reporting according to fields which do not themselves appear in the printed output.

Reports are designed on a video worksheet with separate areas for a title and column headings, markers which delineate the data positions, and identification of the data field associated with each position. (It is also necessary to specify data types again.) Finally, there is a print position scale to help you judge the appearance of the final report.

Obviously, the most important decision is which fields will be included. Once that is settled, "PCF's" full-screen editing capability lets you lay out the report sheet in fairly short order. There are quite a few details to be mastered, but the payoff can be some very professional-looking documents. You can specify automatic pagination, of course; numeric columns can also be totalled, and their average values computed. It is also possible to specify the number of lines per printed page and to send up to five control codes to the printer.

A brief evaluation of "PCF"? It seems to be capable of professional-quality work. Its nuances can't be learned in a half-hour session, but that would be an unrealistic expectation for any applications program in today's computing environment. "PCF" is powerful, flexible, and well supported by the vendor.

RMS (Record Management System)

Washington Computer Services 3028 Silvern Lane Bellingham, WA 98225 (206)734-8248 64K, Frank Hogg Laboratory Flex \$200.00 disk

Another business-oriented system, "RMS" was written with users of 6809-powered "micro mainframes" in mind. The original version was configured for use with the Southwest Technical Products CT-82 video terminal, but recently a new edition has become available, set up for the Color Computer and Frank Hogg Lab's Flex. The documentation is clearly intended for systems programmers working with bigger machines, but there is an insert purporting to list special Color Computer key sequences for various commands. There may still be a few bugs here, as I will discuss.

Like most other big, disk-oriented DBMs, "RMS" uses a number of machine language utilities to handle data definition, input screen formatting, indexing, and other chores. It is not a stand-alone package, though. In addition to Flex, "RMS" requires a text editor to prepare some of the files vital to its operation.

This need not be anything elaborate, as the file structures are rather simple. In fact, Flex's BUILD utility can be used in a pinch. Because "RMS" data files are in standard Flex text format, they can be accessed by other programs — Basic programs, for example. It is also possible to exchange data with "DynaCalc," a Flex spreadsheet program. This can get complicated, but at least the documentation provides the information and sample programs to get you started.

Let's return to more mundane matters. Associated with each "RMS" data file (usually called the master file) are a dictionary and one or more index files and report specification files.

The dictionary is actually the first thing set up, and must be constructed with a text editor. It contains information about the length and type of the data fields — alphanumeric, integer, dollars-and-cents, or date. It must also specify whether the data file will contain primary records only, or a combination of primary and secondary records.

That's worth explaining. If all records in a file have identical structure (as in a mailing list), then they are said to be primary records. They have equal status: each has a unique value of the key field, designated by the user as the field which is to be used for direct access to the file. In a mailing list, this would probably be the individual's name.

On the other hand, there are cases in which a number of associated records share a key field. Then it is useful to distinguish between primary and secondary records; members of each group share a common structure, but the groups themselves may differ.

Examples abound in business. A file may consist of primary records containing mailing list data for each customer, with secondary records for each transaction involving each customer. The customer's name is the key field in every case, but it is shared by one primary and several secondary records.

The dictionary's file name must be given an extension of .DIC. Once it has been set up, one of the programs in the "RMS" package, RMSNEW, is used to create the master data file. This must have the same root name as the dictionary, and an .RMS extension.

Creating the file just means answering two questions: the maximum length of a

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QUASAR ANIMATIONS

1520 Pacific Beach Drive San Diego, California, 92109 record, and the number of records to be stored in the file. Because of the details of the hash coding technique used to store and retrieve records, it is advisable to specify a number about 25 percent larger than the actual anticipated maximum. It is also worthwhile to specify a prime number of records, to speed access by this particular algorithm.

At this point, the "RMS" editor (a program simply called "RMS") can be used to enter data into the master file. This comes down to filling in the blanks in a video form, as in "PCF." Editing is trick-

ier, though.

Presumably because of its heritage on other terminals, "RMS" uses two-key combinations for many common functions: Break-U to update a record, Break-2 to display the next secondary record, and so on. I find the required two-hands technique awkward.

Worse yet, the simple cursor controls are less than obvious. The Down Arrow sends you to the previous field, while the Up Arrow homes the cursor in the first field. It's supposed to, anyway; it did nothing in the review sample of the program.

It's worth mentioning that "RMS" is not the type of editor one would use to build the data dictionary or report formats (see below). It is used to update and delete records, though. It can also be em-

ployed for quick and dirty inspection of

The principal way to get information out of a file, of course, is to define and print a report. "RMS" has a routine called INDEX which creates the indexing files needed to determine the order in which records will be processed for reports. INDEX must be run whenever the master data file has been changed by the addition, updating, or deletion of records.

Report formats are defined by text files of particular syntax, created with a text editor. The name of the index file to be used with a particular report appears as the last line of the report format file.

"RMS" report formatting can be quite elaborate. As should be expected of a professional-caliber package, records can be included or excluded on the basis of high/low bounds or by inclusion in an explicit set of values. It is also possible to summarize the data from one record group (a primary record and its associated secondaries), and to total numeric and money fields. Complete control over the appearance of the printed report is also available.

The "RMS" package has many features which suit it for use in a business environment — especially one in which a systems programmer is available to set

up a DBM. The structures created by "RMS" can be made suitable for use by relatively unskilled personnel; for example, it is easy enough to incorporate validators into the data entry forms. These detect attempts to enter data that may be syntactically correct, but which lie outside of an allowable range.

TIMS (Tape Information Management System)

Sugar Software 2153 Leah Lane Reynoldsburg, OH 43068 (614)861-0565 16K

\$24.95 cassette

Our final review subject, "TIMS," returns us to the world of the cassette-based Color Computer system. It's by no means an afterthought, though; "TIMS" is a convenient, easy-to-learn program.

Authors Donald Dollberg and Richard White, together with the people at Sugar Software, have gone to some lengths to make "TIMS" both robust and accessible to the user. Robustness is hard to quantify, but the program just seemed to me to be unusually smooth-running. I found no unexpected responses to keyboard inputs when working with the review copy.

As for accessibility, the cassette contains two versions of the program: a compressed working copy with unnecessary spaces and line numbers deleted, and a full-blown source code reference version which the experienced user can easily modify. The instruction pamphlet helps by including a good discussion of the structures of data files and of the program itself.

A "TIMS" record can contain up to eight fields, totaling no more than 230 characters. No distinctions are made as to field types; there are no facilities for doing computations, anyway, and the sorting routines work with all kinds of data. These routines are written in machine language, and are guite fast.

Reasonably enough, you begin to create a new file by naming as many fields as you will need, and filling in the data. This involves two of "TIMS'" seven modes, Create and Input, and the program's main menu. Input is also used for adding records to an existing file.

"TIMS" lacks a full-screen editor, but does have a very nice replace-the-phrase editor for modifying a record once all the data has been entered. A phrase can be any combination of symbols sufficient to identify the information to be altered.

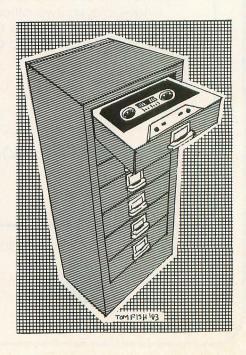
Sorts (ascending order only) can be done on up to three fields at a time. The documentation claims that a badly disorganized 120-record file can be sorted in about 15 seconds, while if the same file is nearly in order the time drops to 3-4 seconds. It is not clear whether these pertain to single or multiple-field sorts.

"TIMS" has a pair of search modes: Range Search and Item Search. As you might guess, the former identifies those records for which a target field lies within a specified range, while the latter looks for an exact match with a specified search term.

In each case, you are prompted for the identifying number of the search field. Range Search then asks for the ends of the range over which a match will be accepted. If you were to search an alphabetic field for entries beginning with M, for example, you would specify these as MA and MZ.

If the file was not sorted according to the search field, Range Search does so at this point. This is actually a two-level sort, extending to the field following the search field (if there is one).

Range Search can be used to review an entire file for editing, etc. The trick is to hit the Enter key in response to the prompts for the limiting search terms. Each record will be presented, once again in ascending order according to



the search field. A simple command line appears at the bottom of the screen: Search, Modify, Delete, Return. Search is used to step through the file; Return means "to the main menu."

In contrast, Item Search does not require a prior sort on the search field. It simply requests a target term in the specified field and returns all matching records. The target can be any unique string of symbols. The same four options are available for each hit as for Range Search, except that Return gets you back to the Item Search menu. In effect, this allows you to AND search criteria together.

"TIMS" makes it fairly simple to produce printed reports, although the options are somewhat limited. Reports are dated and paginated, and titles may be provided at run time. Each record may be represented by single or multiple print lines, and the user can specify which data fields are to appear, and in which order. The names of the fields are not printed as column headings, however.

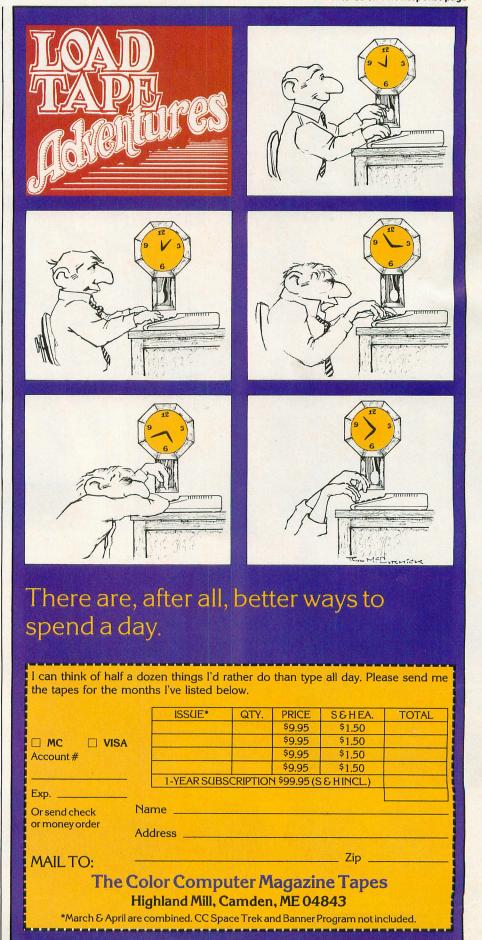
There is no facility for defining and storing multiple report formats. "TIMS" presents a menu of default print parameters which can be over-ridden, but this has to be done each time the program is run.

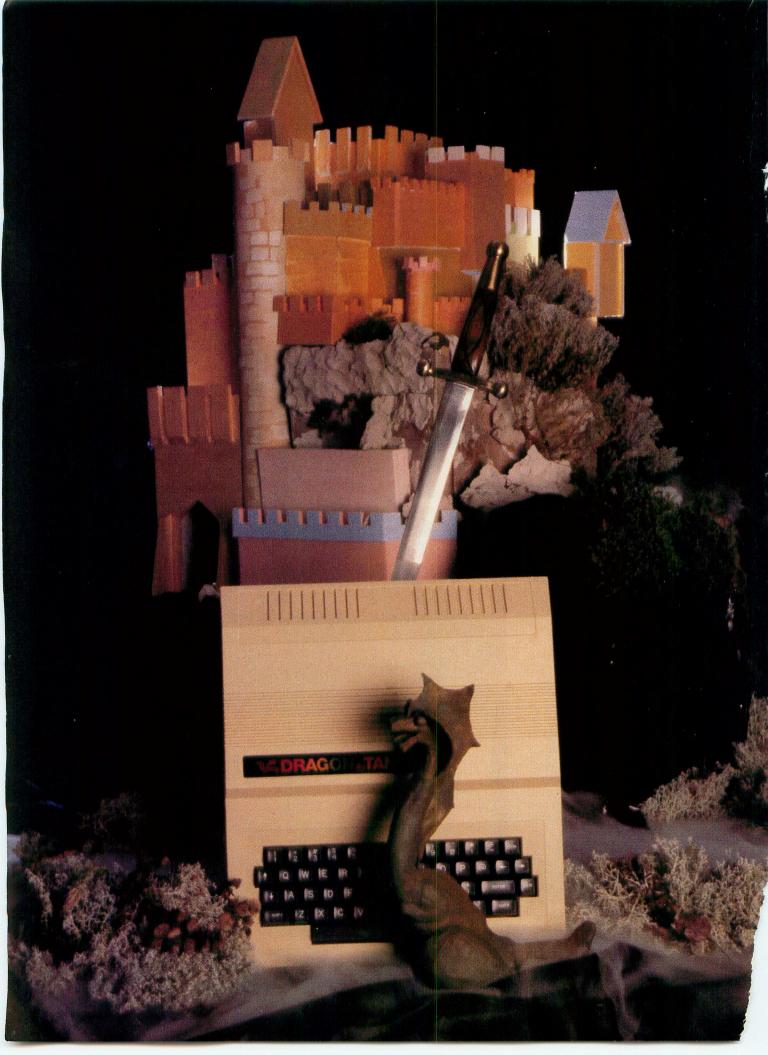
However, the user does have several ways to select which records are to be printed. After the formats have been specified, you receive a selection menu with three choices: Select All Records, Select Range of Records, and From Screen Listing. The first two are self-explanatory; the last one lets you pass judgment on each record in real time.

Files are printed according to the order established in the most recent sort. The sorting field need not actually be printed, however.

"TIMS'" tape-handling routines include facilities for appending one file to another, and for checking for I/O errors after a file is recorded. The append operation requires that there be sufficient RAM left, and that the two files have the same number of fields. The field names of the second file will survive, if there are differences.

While it certainly can't compare in power to the big Flex database managers, "TIMS" can do a very nice job for people who have decided to stick with cassettes. It is restricted to modest file sizes because of its need to store an entire file in memory at once, and of course it would be nice to have some ability to do calculations, but any such enhancements would bring added complexity and expense.





The Dragon!

A review of the computer — finally!

WE HAVE A NEW PET in our house, a Dragon. Not a scaly, fire breathing reptile, but a sleek new computer produced and marketed by Tano Microcomputer Products, a division of the Tano Corporation. The Dragon is being reviewed here because, like the Color Computer, it's a 6809-based computer with color graphics, Microsoft Color Basic, ROM and joystick ports, a 6847 VDG (Video Display Generator), and so on. Many Color Computer programs will run on it. But the Dragon can not be shrugged off as some sort of cheap imitation.

The Tano Corporation is a major supplier of computer control systems for oil well companies. Their equipment uses 6809 processors and the Dragon is a logical extension of Tano's considerable engineering and manufacturing capability. Its \$399 computer has interesting, valuable features potential computer owners will do well to consider.

A Dragon's Heart

The computer consists of two circuit boards, the main "mother" board and a plug-in dc power supply board. The power supply has a large heatsink and, from an engineering viewpoint, should be very reliable. The ac supply is eight and 28 volts, supplied via an external transformer/on-off switch. Separating the transformer from the rest of the system reduces heat build-up in the computer.

The printed-circuit boards are of commercial-grade construction, with most chips soldered in. The exceptions are the SAM (Sequential Address Multiplexer), the processor, the 64K RAM chips, and the two Basic- interpreter ROMS. There is a good-quality cassette relay, no door on the ROM port, and, because of the excellent board layout, a low component count. Interestingly, the number of chips in the Dragon is higher than in the Color

by Doug Kelley and Larry Cadman

Computer (32 versus 25). We attribute some of this to the parallel printer port, the monitor driver and the hardware-implemented RS- 232 interface. There are also two ROMs (EPROMs on our computer) that contain the 32K and 64K interpreters.

A Dragon's Outsides

One big plus is the keyboard. Those of you who have lived with the Color Computer's flat keyboard will appreciate the Dragon's excellent Hi Tek board (the same board sold by Mark Data for the Color Computer). The case is held together with four easy-to-locate screws: their removal will void your 90-day warranty.

The Dragon comes with an external transformer, a TV switchbox, coax cable and a cassette cable. The unit provided for our review came with a Basic programming manual and a tear-out quick reference card. According to Tano there will be a technical manual also — it is definitely needed. Ben Albert, Tano's vice president, said the production version of the Dragon will be shipped with a software pack, including a home finance spread sheet, a Basic word processor, and arcade and adventure games.

The computer has a power input jack, channel select switch, Reset button, joystick and cassette ports that are Color Computer compatible, a parallel printer port, RS-232 port, a monitor driver jack and a ROM cartridge port.

For you game nuts, Dragon joysticks are available for \$29.95, but Radio Shack sticks will work, too.

Software Compatability

One thing that will make or break a computer is support. The Dragon already has a substantial support base because Color Computer Basic — and some machine language — programs will run on it. The Dragon will load programs saved by a Color Computer in ASCII; but, loading a machine language program is not so straightforward. If a machine language program is written using only documented ROM routines, there will be no problems with compatibility. If undocumented ROM routines are used, forget it. (See Table 1 for a cross reference of ROM routines.)

The Dragon originated in England. The Dragon by Tano is made in America. Because the English version has been available for over a year, there is considerable software support for it there. We expect British suppliers to hawk their wares here as soon as they perceive the size of the American market. Tano modified the Dragon for 64K but made the selection of the 64K mode optional. When you fire up the computer, you are in the original 32K mode and the computer will accept, without modification, any of the programs written for the Dragon 32. A British magazine, Dragon User, contains ads from American software suppliers for programs to run on the Dragon 32. We expect these suppliers will also be modifying programs for the 64K version. We also expect someone to write a program that will smooth over a major kink in the Dragon — the unavailability of disk use while in 64K mode (more on that later).

The Dragon's documentation consists of a sketchy introduction to its various connections and ports and a tutorial on Color Basic commands and Basic programming. Tano has assured us that a more complete technical manual is in the works.

Dragon Magic

When the computer is first turned on, a PRINT MEM command yields a value of 24871 bytes. For a surprise, type EXEC. The screen blanks for a second and, when the cursor reappears, nothing seems to have changed, except the cursor is blue instead of black. Type POKE 25,6: NEW and PRINT MEM and the memory size becomes a startling 47385.

Here is what happens: The computer jumps to memory location \$BF49 and disables the interrupts. Next, the computer copies \$8F bytes of the 32K ROM from \$BF5A to \$1DA (the cassette tape buffer) and then jumps to \$1DA. \$1DA, in turn, switches the 32K ROM off, the 64K ROM on, and copies the ROM from \$8000 to RAM at \$C000. Then the computer moves some internal pointers, resets the stack to \$BDF0, and jumps to \$C000 to restart the Basic Interpreter. There really is 64K RAM and you now have 48K of it available for your use.

The 64K mode has only a slight speed penalty for cassette users. Running the benchmark sort program in Program Listing 1, the Dragon produced results in 2:21 minutes in 32K mode, but took 2:31 in 64K. The Color Computer, running the same program, finished in 2:45. All Extended Color Basic commands are available, and, if you have a program in the system in 32K mode and switch to 64K, you do not lose the data... very nice. That's not all; in 64K mode the ROM move subroutine has been replaced with an automatic key repeat subroutine.

more

Benchmark Program

- 10 BENCHMARK PROGRAM
- 20 DIM A(100)
- 30 FOR C=1 TO 100
- 40 A(C) = RND(100)
- 50 GOSUB 140
- 70 FOR X=1 TO 100
- 80 FOR Y=1 TO 99
- 90 IF A(Y)>A(Y+1)

THEN B=A(Y): A

- (Y) = A(Y+1) : A(Y+1) = B
- 100 NEXT Y
- 110 NEXT X
- 120 GOSUB 140
- 130 END
- 140 CLS
- 150 FOR C=1 TO 100
- 160 PRINTA(C);
- 170 NEXT C
- 180 RETURN





Table 1. ROM Subroutines

Name	Color Computer	Dragon	Description
PRINT	\$B99C	\$90E5	Output string pointed to by X + 1 to screen
CLS	\$A928	\$BA77	Clear the text screen
POLCAT	\$A1C1	\$8006	Check the keyboard, return character in A
CHROUT	\$A282	\$B44A	Output A to current device
CSRDON	\$A77C	\$8021	Starts cassette, gets into bit sync
BLKIN	\$A70B	\$B93E	Inputs a block from tape
BLKOUT	\$A7F4	\$B999	Outputs a block to tape
JOYIN	\$A9DE	\$8012	Reads the joysticks, stores in \$15A-\$15D
WRTLDR	\$A7D8	\$801B	Turns cassette on, writes leader
SOUND	\$A951	\$BA9A	Sound for \$8C pitch, B duration
PRNNUM	\$BDCC	\$957A	Outputs the number in D to current device
GETADD	\$B73D	\$8E83	Gets value of expression, return in X

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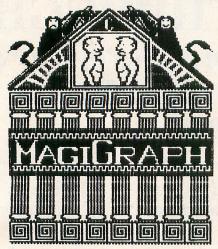
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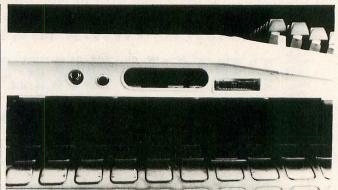
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Dragon's composite, modulated video output; and reset, joystick, tape, serial I/O, and printer ports.

More magic: The 64K mode is in RAM, but doesn't evaporate when you hit Reset. Don't believe it? We have supplied a list (Figure 4) of Basic words and their addresses. Try POKEing a new word of the same length into the memory location given. You can modify the interpreter and yet it is not volatile.

Achilles' Heel?

Running a Dynamite+ disassembly of the Basic ROMs gives us a closer look at how Tano implemented some of its features. In the two memory maps of Figure 1, you can see that the locations of the Basic interpreter, cartridge memory, I/O, etc. are not too different from those in the Color Computer. Looking at Figure 2, however, we see a big difference. Note that in a 64K Color Computer, Basic resides smack in the middle of RAM, thus

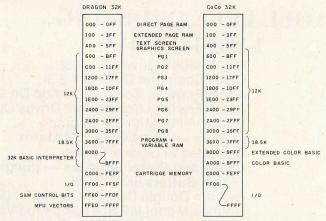


Figure 1. Dragon and Color Computer memory maps, 32K.

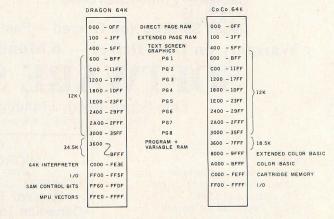
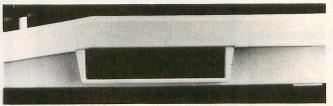


Figure 2. Dragon and Color Computer memory maps, 64K.



Dragon's power supply, and monitor ports and channel button.



Dragon's ROM port.

limiting user RAM to the lower 32K. In 64K mode, the Dragon has Basic "up top," opening up a full 48K of contiguous RAM for use by Basic.

Sharp-eyed observers may notice one potential problem with this scheme. With the 64K interpreter residing at C000, what about cartridges and DOS? Cartridges present no problem because they typically auto-exec and don't require Basic. But DOS requires Basic to be present, so when you EXEC 64K, you write over the DOS and therefore will not be able to use disks in 64K mode unless some third party software is written for the Dragon.

RS-232, OS-9, **And Printer Ports**

In the Color Computer, serial I/O is accomplished via software. Each bit transmitted is clocked out by a subroutine in the interpreter. What this means is that anytime you are sending or receiving data, the CPU is involved. With the Dragon, you have a real, live, hardware-implemented RS-232 port. This is accomplished by using a 6551 ACIA chip (an asynchronous communication interface adapter). The advantage of this device is that it allows a full byte to be loaded by the CPU, which may then go on to other tasks. The byte is transmitted from the ACIA by a cheap clock signal, rather than by an expensive CPU (Central

Have you heard of OS-9? OS-9 is a multi-user operating system that allows remote-users access to the computer via the RS-232 port. In the Color Computer, remote access will tie up the host 100 percent of the time. In the Dragon, remote access will require only a "time slice" from the CPU. This is why Radio Shack feels obliged to introduce its "Deluxe RS-232" program pak (cat. no. 26-2226) — a hardware-implemented port similar to the Dragon's, but costing \$79.95.

Pinout for the serial port is shown in Figure 3a. The reason for including + and -12v is not really clear, nor does it seem like a good idea, unless Tano is planning to produce peripherals that need these voltages.

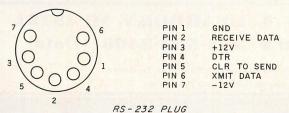


Figure 3a. Pinout for Dragon's serial port.

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1	3	5	7	9	11	13	15	17	19	PIN 1	+5V	PIN 11 PIN 12	GND BIT 4
	-	1/4								PIN 3	DATA BIT O	PIN 13	DATA BIT 5
										PIN 4	+5V	PIN 14	GND
							_	_		PIN 5	DATA BIT 1	PIN 15	DATA BIT 6
						П				PIN 6 PIN 7	GND DATA BIT 2	PIN 16 PIN 17	GND DATA BIT 7
100							16	40	20	PIN 8	GND GND	PIN 18	GND
2	4	6	8	10	12	14	16	18	20	PIN 9	DATA BIT 3	PIN 19	ACKNOWLDG
										PIN 10	GND	PIN 20	BUSY

Figure 3b. Pinout for Dragon's parallel port.

The printer port on the Dragon is a triumph of ingenuity. There are two PIAs (Peripheral Interface Adapters) in the Color Computer. There are two PIAs in the Dragon. So where do you get a parallel port?

More magic?

No, Tano simply multiplexed one port of a PIA to handle keyboard I/O and the printer port, too. This creates no problems because you don't input through the keyboard while printing, anyway. Viola! Something for (practically) nothing. The two ports are toggled by POKEing location 3FF.

One other item of interest is the

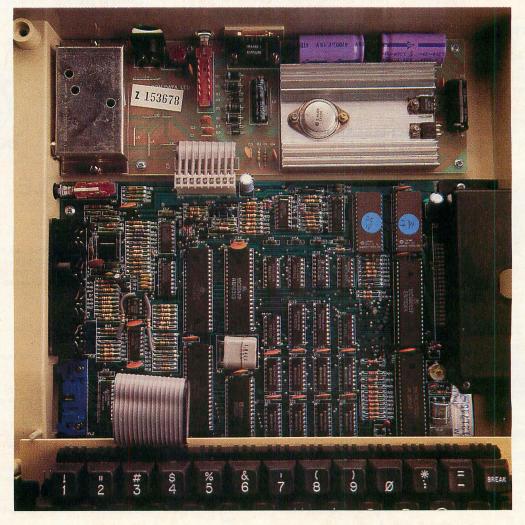
74LS244, line driver. This chip, which feeds the parallel port, is a "line" driver, not a "bus" driver. The difference is that with a line driver you can locate your printer quite a distance from the computer and not worry about interference from noise. Pinout for the parallel port is shown in Figure 3b. The connections are Centronics compatible.

Table 1 documents some useful ROM subroutines. The information compares these locations for the Dragon and Color Computer. Hopefully this information will encourage experimentation with converting existing Color Computer ML programs for use on the Dragon.

Future Features

Dragon will have four disk drives, holding 180K each. They will be run under "Dragon DOS" and format with 40 tracks, 18 sectors per track, with the directory on track 20. Tano drives will be half height with two drives per case. OS-9 is being written to run on the Dragon, too, which indicates the degree of Tano's commitment to its product. Marketing plans for the Dragon include a dealership network of computer specialty shops and distribution through "high end" department stores.

Dragon purchasers receive with their new computer nine programs on a single cassette, all adopted and enhanced for that computer. The nine programs include five of the "CC" series — Writer, Mailer, Calc, Merger, and Filer — and Courier Pilot, which helps users learn Basic, plus three games: Tower of Fear, Gold Digger, and Dragon Quest.



The mother board.



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CU*BER

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Approaches the excitement and challenges of any Video Arcade. The

hazards of CU*BER are many. Help CU*BER change the colors on the pyramid while avoiding many of the dangers always present. Vipers, the Nurd, the Dork, bonus points all add up to another exciting release from Tom Mix Software.



Arcade Action. Method of play you are the Grabber. The object is to grab the 8 treasures and store them in the center boxes. You start with 3 Grabbers and get extra ones at 20,000 points. Watch out for the googlies! Super high resolution graphics.

16K Machine Language \$27.95 TAPE \$30.95 DISK



AIR TRAFFIC CONTROLLER

32K Ext. Basic \$28.95 TAPE \$31.95 DISK

Air Traffic Controller is a computer model of an air traffic control situation in which Remotely Piloted Vehicles (RPV's) are operated by the controller in landing on and taking off from designated runways.



DEVIL **ASSAULT** 16K Machine Language \$27.95 TAPE \$30.95 DISK

Devil Assault is a multi-level multi-screen game in which bird-like creatures, robots and the devil himself assault your home base which you must defend.

BUZZARD BAIT By RUGBY CIRCLE 16K Machine Language

\$27.95 Tape \$30.95 Disk

We've done it again! You thought the King was great? wait 'till you see this!!

Outstanding high resolution graphics, tremendous sound make this "Joust" type game a must for your software collection. As you fly from cloud to cloud you will enjoy sky high excitement dealing with the challenges presented to you by this newest release by Tom Mix Software.



JOURNEY TO MT. DOOM

32K Mach. Lang. \$27.95 DISK ONLY

The Necromancer is about to wage war on

earth. He needs his lost gold ring to acquire the power to do so. You must find the ring, take it to Mt. Doom and destroy it in the flames from which it came, thus eliminating the Necromancer's evil powers.



"THE FROG"

ARCADE ACTION

This one will give you hours of exciting play. . . Cross the busy highway to the safety of the median and rest awhile before you set out across the swollen river teaming with hidden hazards. Outstanding sound and graphics.



16K MACHINE LANGUAGE \$27.95 TAPE \$30.95 DISK

JUNIOR'S REVENGE

Climb vines, avoid obstacles & creatures to save your father from Luigi.

32K CASS \$28.95 32K DISK \$31.95

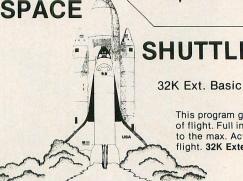




"TRAPFALL"

By KEN KALISH

ARCADE ACTION
The "Pitfalls" in this game are many. Hidden treasures, jump over the pits, swing on the vine, watch out for alligators, beware of the scorpion. Another game for the Color Computer with the same high resolution graphics as "The King."



SHUTTLE \$28.95 TAPE \$31.95 DISK

> This program gives you the real feeling of flight. Full instrumentation complete to the max. Actual simulation of space flight. 32K Extended Basic

16K MACHINE LANGUAGE TAPE \$27.95 DISK \$30.95

THE KING

32K Machine Language \$26.95 TAPE \$29.95 DISK

ARCADE ACTION - How high can you climb? Four full graphic screens. Exciting Sound - Realistic graphics. Never before has the color computer seen a game like this. Early reviews say: Just like the arcade Simply outstanding!

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BIRD ATTACK - A fast paced machine language arcade game. Shoot the birdmen before they descend upon you. Watch out for their bombs! 16K Machine Language \$21.95

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SEARCH!



Find out where any data string is located in ROM.

by Stephen P. Allen HEN I GOT MY EDTASM+, the manual described how to examine memory, then said, You are now invited to examine each section of memory using ZBUG..." I then began to peruse the Basic ROMs. When I found what seemed to be an important routine, I wondered where it was called from and how many times in Basic it was called. This program is the result. It searches the Basic ROMs for occurrences of instructions or any other data I'd like to find. When loaded and run, the program prompts, "SEARCH FOR WHAT?" Enter a data set (the target string) in hex. For example, a routine to convert an ASCII number string into binary is at \$AF67. \$BD is the opcode for JSR (Extended),

and BDAF67 is what you type in to find from where the routine is called.

The program then asks whether to search Basic; Extended-plus Basic; or Extended Basic only. Enter option number 1,2, or 3.

After a half second (!) the answers come back: "Eight found." Eight addresses, all in hex, are listed on the screen. Hit any key to do another search.

Search was the first program I ever wrote in machine language, and when I got it up and running I realized how fast a computer is: fast enough to search over 16,000 memory locations in half a second! At first I couldn't believe the program was working correctly, but after careful examination with ZBUG I was convinced.

Error checking is minimal. If you don't enter an even-length target string, you have to try again. The program recognizes only even-length target strings because a byte of memory is represented by two hex digits. If the target string is longer than 20 characters you'll have to enter it again. If anything other than hex is entered, it probably won't crash the program.

A very short, often-occurring target string, such as "86",(LDA#) will crash the program. In Line 350, STX A,Y treats A as a signed binary number. After the 64th occurrence of the target string, NRFND has 128, or \$80, which is a negative number in twos-complement notation. At the next occurrence of the target string, the address where it was found will be stored in reverse direction from FNDTBL, and succeeding entries will overwrite the program. However, I have never found this to be a problem in normal use.

One nice thing about Search is its relocatability. The machine language routine can be put just about anywhere in RAM simply by changing two numbers at the start of the program. Be sure to leave room for FNDTBL.

♦ Programs

TALKING PROGRAMS

TALKING FINAL COUNTDOWN

(by Bill Cook)

Now speech has been added to the excitement of this superb adventure. You must stop the mad general from launching a missile at Moscow and causing WWIII. Has multiple voices for added realism.

For 32K EXT\$24.95 Standard cassette FINAL COUNTDOWN\$14.95

SPELL-A-TRON

This educational program will assist in teaching children how to spell. The program allows the user to build a dictionary of words, with proper pronunciation as well as spelling, and then the test mode can be entered for use by the child. The program will both spell the word and say the word if the child is not correct. Uses only positive reinforcement, and is very user friendly. For ANY age child or adult. With documentation. 32K EXT \$28.95

TALKING SCORE E-Z

An excellent adaptation of vahtzee type program with the addition of speech. Up to six players can compete at a time, and all scoring and record keeping is done by the computer. Requires the Spectrum Speaker, and 32K ext. basic. Let your computer talk to you for a change.

Standard SCORE E-Z\$15.95

All JARB Software talking programs require the Spectrum Speaker to work. Look for more talking programs to come.

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Program Listing. Search

- 10 'TO RELOCATE M/L ROUTINE
- 20 'ADJUST THE ADDRESSES IN
- 30 'LINES 40 AND 50
- 35
- 40 CLEAR 200, &H 7F00
- 50 AD = &H 7F00
- 60 DEF USR 0 = AD
- 70 FOR C = AD TO AD+76
- 80 READ OP : POKE C,OP
- 90 NEXT C
- 100 CLS
- 110 INPUT "SEARCH FOR WHAT"; T\$
- 120 L = LEN(T\$)
- 130 IF L AND 1 THEN 100
- 140 IF L>20 THEN 100
- 150 M = AD+83 'Starting address
- of 'TARGET'
- 160 FOR E = 1 TO L STEP 2
- 170 T = VAL("&H"+MID\$(T\$,E,2))
- 180 POKE M,T
- 190 M = M+1
- 200 NEXT E
- 210 POKE AD+81, L/2 'String leng
- th (LENTS)
- 220 PRINT "SEARCH LIMITS:"
- 230 PRINT "1 = BASIC ROM ONLY"
- 240 PRINT "2 = BASIC+EXTENDED"
- 250 PRINT "3 = EXTENDED ONLY"
- 260 INPUT "1,2,3";I
- 270 IF I<1 OR I>3 THEN 230
- 280 ON I GOSUB 440, 460, 480
- SOUND 200, 1 290
- 300 P = USR(0)
- 310 SOUND 100, 1
- 320 CLS
- 330 PRINT @1, T\$
- 340 ON I GOSUB 500, 510, 520
- 360 PRINT P; " FOUND" : PRINT :
- IF P = 0 THEN 410
- 370 F = AD+93 'FNDTBL
- 380 FOR A = 1 TO P
- 390 PRINT HEX\$(PEEK(F)*256 + PEE
- K(F+1)), 'ADDRESS
- 400 F = F+2 : NEXT A
- 410 IF INKEY\$ = "" THEN 410
- 420 GOTO 100
- 430
- 440 POKE AD+77, &H AO : POKE AD+
- 'SRCHST 78, 0
- 450 POKE AD+79, &H BF : POKE AD+
- 80, &H FF : RETURN 'SRCHND
- 460 POKE AD+77, &H 80 : POKE AD+
- 78, 0 'SRCHST
- 470 POKE AD+79, &H BF : POKE AD+
- 80, &H FF : RETURN 'SRCHND

480 POKE AD+77, &H 80 : POKE AD+ 570 DATA 58,36,46,161,132 580 DATA 38,245,52,52,90 78, 0 'SRCHST 590 DATA 39,16,48,1,49 490 POKE AD+79, &H 9F : POKE AD+ 80, &H FF: RETURN 'SRCHND 600 DATA 33,166,164,161,132 500 PRINT @33, "BASIC" : RETURN 610 DATA 39,243,53,52,166 510 PRINT @33, "BASIC + EXTENDED 620 DATA 164,32,224,166,140 ":RETURN 630 DATA 31,53,20,49,140 520 PRINT @33, "EXTENDED": RETURN 640 DATA 37,175,166,139,2 530 DATA 174,140,74,230,140 650 DATA 167,140,19,53,32 660 DATA 166,164,32,203,230 540 DATA 75,49,140,74,111 550 DATA 140,70,166,164,48 670 DATA 140,10,84,79,126 560 DATA 31,48,1,172,140 680 DATA 180,244

		TOGI ATTI LISTIN	g. WIACI	nine Language Ro	<i>aune</i>
0000 AE	8C 4A	00100 START	LDX	<srchst, pcr<="" th=""><th>START LOOKING HERE</th></srchst,>	START LOOKING HERE
0003 E6	8C 4B	00110	LDB	<lents, pcr<="" td=""><td></td></lents,>	
0006 31	8C 4A	00120	LEAY	<target, pcr<="" td=""><td>POINT Y AT TARGET</td></target,>	POINT Y AT TARGET
0009 6F	8C 46	00130	CLR	<nrfnd,pcr< td=""><td>NONE FOUND YET</td></nrfnd,pcr<>	NONE FOUND YET
000C A6	A4	00140	LDA	, Y	FIRST BYTE OF TARGET
000E 30	lF	00150	LEAX	-1,X	PREP FOR LOOP
0010 30	01	00160 LOOP1	LEAX	1,X	NEXT ROM ADDRESS
0012 AC	8C 3A	00170	CMPX	<srchnd, pcr<="" td=""><td>LAST ROM ADDRESS?</td></srchnd,>	LAST ROM ADDRESS?
0015 24	2E	00180	BHS	DONE	YES
0017 Al	84	00190	CMPA	, X	MATCH?
0019 26	F5	00200	BNE	LOOP1	NO, TRY AGAIN
001B 34	34	00210 MATCH1	PSHS	Y,X,B	
001D 5A		00220 LOOP2	DECB		LAST BYTE OF TARGET?
001E 27	10	00230	BEQ	FOUND	YES
0020 30	01	00240	LEAX	1,X	NEXT ROM
0022 31	21	00250	LEAY	1,Y	NEXT TARGET
0024 A6	A4	00260	LDA	, Y	
0026 Al	84	00270	CMPA	, X	MATCH?
0028 27	F3	00280	BEQ	LOOP2	YES
002A 35	34	00290	PULS	B,X,Y	
002C A6	A4	00300	LDA	, Y	GET FIRST BYTE BACK
002E 20	E0	00310	BRA	LOOP1	TRY AGAIN
		00315			
0030 A6	8C 1F	00320 FOUND	LDA	<nrfnd,pcr< td=""><td>OFFSET INTO FNDTBL</td></nrfnd,pcr<>	OFFSET INTO FNDTBL
0033 35	14	00330	PULS	B,X	RESTORE FOUND ADDRESS
0035 31	8C 25	00340	LEAY	<fndtbl, pcr<="" td=""><td>TO X</td></fndtbl,>	TO X
0038 AF	A6	00350	STX	A,Y	AND SAVE IT
003A 8B	02	00360	ADDA	#2	NEW OFFSET
003C A7	8C 13	00370	STA	<nrfnd,pcr< td=""><td></td></nrfnd,pcr<>	
003F 35	20	00380	PULS	Y	
0041 A6	A4	00390	LDA	, Y	FIRST TARGET BYTE
0043 20	CB	00400	BRA	LOOP1	
		00405			
0045 E6	8C 0A	00410 DONE	LDB	<nrfnd,pcr< td=""><td></td></nrfnd,pcr<>	
0048 54		00420	LSRB		DIVIDE BY 2
0049 4F		00430	CLRA		MAKE 16-BIT NUMBER
004A 7E	B4F4	00440	JMP	\$B4F4	GIVE IT BACK TO BASIC
		00445			
004D		00450 SRCHST	RMB	2	
004F		00460 SRCHND	RMB	2	
0051		00470 LENTS	RMB		
0052		00480 NRFND	RMB	1	
0053		00490 TARGET	RMB	10	
005D		00500 FNDTBL	RMB	128	
	00DD	00510 ZEND	EQU		LENGTH OF THIS ROUTINE
	0000	00520	END		
00000 T	OTAL ERRORS				
DC	NE 0045	LOOP1 (0010	NRFND 0052	START 0000
	DTBL 005D		001D	SRCHND 004F	TARGET 0053
	UND 0030		001B	SRCHST 004D	ZEND 00DD
and the second section of the	NTS 0051				

The OS-9 experts have developed something new.

C Compiler Version 2 for color computer OS-9 DOS for color computer Relocatable Assembler for Flex and CoCo DOS

C Compiler

Dugger's Growing Systems C is the original C Compiler for the 6809 and is the proven leader in the field. It is a growing subset of the C programming language. It runs in 20K, has assembly language output, position independent code, an extensive library in assembly language source, and code optimizer.

The Color Computer and Flex (which will run on the Color Computer) are now both available with full floating point package (float, long, for, goto, etc.) in addition to the basic C commands. CoCo Dos also contains features which use the BASIC ROM functions (cls, polcat, partial floating point, etc.).

Dugger's Growing Systems has the cost effective C for OS-9. It contains all the necessary C commands (while, if, if else, int., char, etc.) which may be linked, loaded, and used in a multi-user, multi-tasking environment.

Relocatable Assembler

The relocatable assembler package includes assembler, linker, and manager. May be used with the Color Computer or Flex.

Symbols up to 32 characters \square Many special characters allowed in symbols (\$, %, etc.) \square Multiple files assembled without exiting the assembler \square Direct output to printer at any time \square Generates either absolute or relocatable modules which are linked together with RLINK to generate executables \square Supports two types of global variables (VAR and COMN) Fortran type common \square Compatible with source for most assemblers \square Macros with parameters \square Conditional assembly.

Linker

Use text-like files which are generated by RASMB or any other source □ Allows inclusion of multiple source files, each of which can have any number of program modules □ Provide for library files, whose modules are included only as required □ Specify at link-time execution address and global storage area for easy generation of ROM-able code □ Will link together both absolute and relocatable modules □ Extensive linkage information output on request.

Manager



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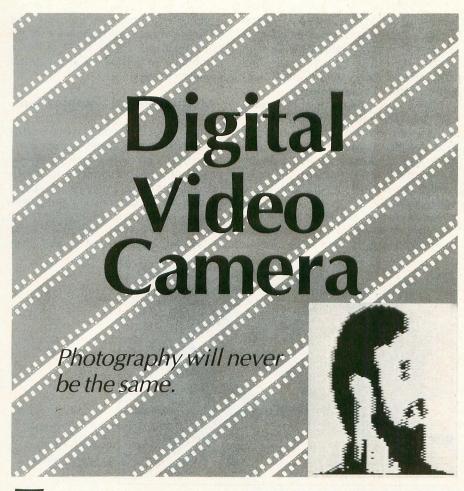
Provide a tool to build a "library" of relocatables

Edit feature to list, insert, and delete modules.

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HE MICRONEYE DIGITAL imaging camera can, with the help of some software, provide multi-colored video images of people, photographs, and other subjects. Patience, however, is required to capture and process a good set of images.

The Microneye is not a substitute for a home video camera and recorder. You cannot aim, shoot, and instantly get TV-quality pictures. However, once a clear Microneye image is on the screen, you have something no video camera and recorder can offer — a digitized image for storage and processing.

Potential applications include the digitizing of drawings and photos, noncontact tracing and measuring of solid objects, and live video portraits. Storing images on tape or disk is one obvious related project. It may also be possible to communicate with the Color Computer without the keyboard, using hand signals through a windowpane, even from outdoors. Yet another project might be optical character recognition (text-reading), like postal service researchers are doing.

System Description

The system I used for my experiments was a small Microneye "bullet" camera

by Howard Bassen

with a standard TV camera lens mounted on a tripod .The camera was connected to an electronics package with a flat cable about four feet long and one inch wide. The three-by-nine inch electronics package plugged into the ROMpak port, so no disk operation was possible without an expansion box or a switch.

The electronics package that plugged into the ROMpak port provided interfacing functions between the computer and the camera system, and housed the driving electronics for the camera's chip. It also decoded commands from the computer.

The system drew power from the computer, so no ac plug was needed for the camera system. The electronics box plugged into the computer with a bareboard connector.

Behind the screw-on lens sat the imaging chip with two rectangular 32K-pixel arrays. These allow production of a full, square display rather than the rectangular display that would be produced by a single array.

How Microneye Works

The heart of the Microneye is a low-cost, high resolution, solid-state 64K RAM video imaging chip with a transparent lid, so a computer can read the chip's output directly. Being a digital chip, each picture element (pixel) responds only to the part of the scene it views with an "on" or "off" (high or low) status signal.

The chip consists of 32768 elements arranged in 256 columns by 128 rows. When used as a memory chip, each element can be sent an electrical pulse to "set" it either "high" or "low" — to zero or to five volts — until the power is turned off, or until the computer changes the value of the bit. The computer can read each bit without changing the value of it. With the imaging chip, when light falls on an individual element or bit that has been set high, the voltage discharges toward zero volts. The speed with which it falls is proportional to the strength of the light. Until the voltage falls to less than about 2 volts, the computer will still read this bit as "high" or a "one." In the imaging mode the computer reads the level of each bit a fraction of a second after it has set the bit "high." This means the computer can only tell if the light that's falling on the chip is stronger than a certain value by sensing if the bit is low instead of high. If a lens focuses an image on the chip, different cells can be read as either high or low at any instant. The image can be sent to memory, also 256 by 128 elements in PMODE 4, which creates a black and white picture of the image focused on the chip.

By changing the time between the setting of imaging elements "high" and the reading of their value, the computer senses the different light levels falling on the various areas of the chip. This is the principle I have used to take different "exposure-time shots" of the same subject, and to color bits or pixels that are "low" differently for each exposure time.

The Microneye system software is two Basic programs and a machine-language driver program on one cassette. An assembly language program was included, too, presumably for use in developing modified machine-language programs.

The "Meye" Basic program runs on a 16K Extended Basic system and provides a menu of functions; run, change arrays, change picture size, set exposure time, reset, and exit. The picture size option provides a choice of four resolution/screen-display formats; 512 by 128, 256 by 128, 256 by 64, or 128 by 64. These numbers refer to the imaging chip pixels rather than the Color Computer display,

since the PMODE 4 resolution is 256 by 192. The ARRAY command has a "1 array" or "2 array" option. If the "1 array" option is selected, only the top half of the video screen has an image produced on it, depending on the picture size selected. If the "2 array" option is selected, a full screen image can be obtained, again depending on the picture size selected. Here I found problems. There was a slight difference in the contrast levels of the two halves of the full-screen image, and there was a small portion of the image missing along the center line.

The final option available is to set the exposure time in milliseconds. Times range from 1/1000 of a second to 10 seconds, with the "initial set-up" value being 100 milliseconds (1/10 second).

For a test image I used the Bob Dylan "Times They Are A-Changin'" record album jacket. That album jacket bears a photo of Dylan and some large block lettering. Using a 16mm focal length lens, I had to place the camera about four feet from the subject. With a 100 millisecond exposure and an incandescent bulb, I had to open the lens to its maximum value—f. 1.6. This made focusing critical, so I switched to much longer exposure times (600 to 1000 milliseconds), and operated at higher f stops, with their easier focusing (better depth of field). The images on the screen were clearly "binary"—either black or white pixels at each point on the screen. Absent were the many shades of gray that reveal subtle features.

After a little while I understood the basic requirements for getting decent images. I choose the distance from the subject to the lens to get the subject on the screen, re-aim the camera to center the subject on the screen, and experiment with exposure times and focusing.

Beyond The Instructions

No instructions are provided on how to freeze an image and store it on tape, so I wrote a simple program to do that, and another to transfer the tape image file to disk.

Then I decided to try out the imaging system with black-and-white photographs, line drawings and cartoons, a doll, and people willing to pose for portraits. Portraits were difficult until some friends and I discovered a trick that allowed us to bring out the features of a person's face. Light shining directly on a face from the front generates good contrast only between the hair and face. The camera could barely see a person's eyes, mouth, or glasses. But by holding the lamp (a 60 watt bulb in a spotlight hous-

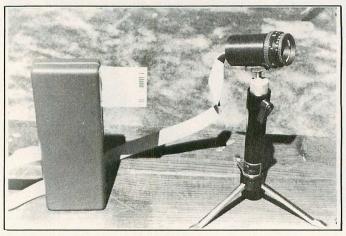
ing) above and at different angles to the person's face, shadows accenting their features were cast. By viewing the image on the TV screen while slowly moving the lamp around the subject a greatly improved portrait can be captured.

Taking video images of photographs was only moderately successful. Again, the lack of contrast between a person's face, for instance, and the background made certain features hard to see on the screen. Using a photographic profile of myself, the digitized image turned out reasonably well, due to the contrast between my beard and the background. However, my nose did not show up (see figure on title page). I tried some cartoons

made up of narrow lines and found that all lines did not show up reliably for the same exposure value. Multiple-image combining is needed to get improved computer images.

Multiple Image Combination

Micron says the limitations of the camera and its "binary images" can be overcome by storing several black-and-white images of the same subject, each taken with different exposure times. This process captures the different levels of gray in a black-and-white photo, or the different colors in a color photo, then stores them as several, individual black-and-white



The Microneye Digital View System Camera

Program Listing. To Save Microneye Files to Tape

9990 REM PROGRAM TO SAVE "MEYE" FILES TO TAPE. TO USE, ADD LIN ES 10000 -10050 TO MEYE PROGRAM AND RESAVE ON TAPE. TO OPERATE, HIT THE SPACEBAR WHILE VIEWING IMAGES, THEN CHOOSE OPTION <6> (EXIT) AND THEN 'RUN 10000' 10000 CLS

10010 PRINT @0, "SELECT NUMBER OF CHOICE"

10012 PRINT @ 32,"<1>-VIEW IMAGE

10014 PRINT @64, "<2>-SAVE IMAGE"

10016 PRINT @96, "<3>-RETURN TO M AIN PROGRAM"

10018 INPUT V: IF V=1 THEN 10020 ELSE IF V=2 THEN 10040 ELSE IF V=3 THEN 10050

10020 PMODE4,1:SCREEN1,1

10030 GOTO10030

10040 INPUT"FILE NAME?"; W\$: CSAVE M W\$, &H600, &HlDFF, &H600

M W\$, & HOUU, & HIDFF, & HO
10050 RUN

94/January 1984



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Chromasette

P.O. Box 1087 Santa Barbara, CA 93102 (805) 963-1066 digital images. These different blackand-white images can be computer processed to provide a single multi-colored image, with each color representing the white pixels in one of the several "binary" images. Software for this is not provided by the manufacturer, sol wrote an Extended Basic program to do this "artifical color" conversion.

My program yields colorful images that bring out a subject's features in an abstract art, high-tech style. It loads in an individual binary image file (saved previously on tape or disk). By processing binary, black-and-white images of the same subject with different exposure times for each image, a four-color image can be created. The binary image is loaded into graphics pages five to eight and becomes a two-color image in pages one to four. By loading and processing several binary image files separately, with a different foreground color used for each output image, multi-color overlays are created on the same screen.

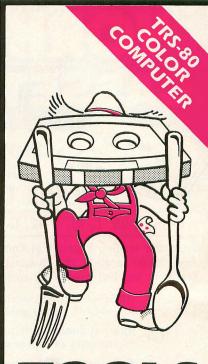
The program takes several minutes to process each black-and-white image, and you can have fun watching it scan vertically and coloring selected pixels on the screen. (I don't think it's important to speed up this process with assembly lanquage graphics programming.)

To improve on my portrait with the missing nose, I used the interactive drawing program "Drawer" (August, 1981 Chromasette Magazine) to add a nose and a forehead outline. This is all done using the arrow and other keys so that you can edit the picture on-screen, then save it on tape or disk. By viewing the color image in screen color sets 0 and 1, and in PMODEs 3 and 4, you can see many combinations of colors and contrasts. If you turn down the color control of your TV set, or if you use a black and white set, different colors appear on the screen as different shades of gray.

I recently saw the Radio Shack CGP 115 four-color graphics printer and a listing of a high-resolution screen dump program for the Color Computer. Imagine getting four-color images in hard-copy form!

If you would like copies of the raw (binary) and processed (artificial color) images for viewing and experimenting on tape, along with the color-processing, display-selection program of Listing 3, send \$7 to H.I.B. Software, 3505 Hutch Place, Chevy Chase, MD 20815.

The Microneye Camera is available from Micron Technology, Inc., 2805 East Columbia Rd., Boise, ID 83706, (208)383-4000. The cost of the system with lens, camera, electronics and software was recently listed as \$295. —Ed. Programs



TOOLS

Programs that make it easy to exploit the power and beauty of your Color Computer without making it hard on your wallet:

Graphics #1 - Displays and text delightfully manipulated! Watch and use First Cover, Drawer (the best drawing program anywhere), Graphtext (puts text on the graphics screen), Smalltext, Rotate (create and spin 3D objects in real time), World Map, 3D World, Star Map, String Art, Kaleidoscope, and Display Demo (text screen wizardry)!

Utilities #1 - Programming is simpler when you use Lister, Listmod, Newtrace (a better TRON), Lazkey (define keys as phrases), Append (easily combine two BASIC programs), BASIC Map, Varmap, Deleter, and CK Monitor (look at and modify memory).

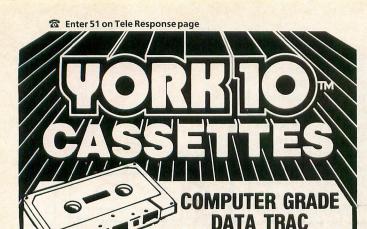
Disk Utilities #1 - Harness the hidden powers of your disk system with Disk Edit (change things on disk directly), Disk Aid, Offset (EXECs most tape-only programs), Track Lock, DIR Save/Get (foil I/O errors), Cataloger, Master Catalog (keep track of your program library), and File Copy (a better BACKUP).

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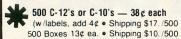
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Program Listing. To Transfer Files to Disk

1 REM PROGRAM TO TRANSFER MICRON EYE IMAGE FILES FROM TAPE TO DIS CLS: PRINT @ 0, "SELECT NUMBER OF CHOICE" 3 PRINT @32, "AND <ENTER>" 4 PRINT @ 64,"<1>-LOAD TAPE FILE AND VIEW" 5 PRINT @96, "<2>-SAVE TO DISK" 6 INPUT V: IF V=1 THEN 10 ELSE IF V=2 THEN 10010 CLS: INPUT "TAPE FILE NAME"; X\$ 20 CLOADM X\$,&H800 30 PCLEAR8 40 PMODE4,1:SCREEN1,1 50 GOTO50 100 CLS: INPUT DISK FILE NAME"; N 110 SAVEM N\$, PEEK(188)*256, PEEK(188) * 256+(1536*4)-1,44553 120 END

Program Listing. To View, Save and Process

1 REM PROGRAM FOR MICRONEYE CAME RA FILE PROCESSING, VIEWING AND 16K EXT SAVING BY HOWARD BASSEN BASIC 3 REM ****DISK OWNERS**** SEE LI

NES 81 AND 2011 FOR 32K DISK BA SIC CONVERSION

5 PCLEAR8

10 CLS

20 PRINT @ 0, "SELECT NUMBER OF C HOICE

21 PRINT @32, "AND <ENTER>"

22 PRINT @ 64,"<1>-LOAD FILE"

@ 96,"<2>-PROCESS/CONVE 24 PRINT

RT TO "

25 PRINT @ 132, "MULTI-COLOR"

26 PRINT @ 160, "<3>-VIEW IMAGES"

28 PRINT @ 192,"<4>-SAVE IMAGE"

30 INPUT V: IF V=1 THEN 60 ELSE

IF V=2 THEN 90 ELSE IF V=3 THEN 1000 ELSE IF V= 4 THEN 2000

ELSE 30

60 PRINT" LOAD LONGEST EXPOSURE FIRST" IMAGE

70 INPUT "ENTER FILE NAME"; W\$

75 AUDIOON

80 CLOADM W\$,&H1800
81 REM FOR DISK SYSTEM SUBSTITUT
E THIS FOR LINE 80 : LOADM W\$,&
H1800
85 END
90 INPUT"IS THIS FIRST IMAGE <y n="">?"; K\$</y>
100 IF K\$="Y" THEN 110 ELSE 150
110 INPUT"SELECT BACKGROUND COLO
R 1=YELLOW 2=GREEN 3=BLUE 4=RE
D";T
125 IF T<1 THEN110
130 IF T>4 THEN 110
135 T=INT(T)
140 PMODE3,1:PCLS T
160 INPUT"ENTER FOREGROUND COLO
R 1=YELLOW 2=GREEN 3=BLUE 4=RED";B:B =INT(B): IF B>4
THEN 160
170 IF B<1 THEN 160
180 PMODE4,5
190 SCREENI,1
200 FOR I= 1 TO 250 STEP2
210 FOR J=1 TO 190
220 PMODE4,5
230 Y=PPOINT(I,J) 240 IF Y=5 GOSUB290
240 IF Y=5 GOSUB290 250 NEXTJ
260 PLAY"L20;A"
270 NEXT I
280 PLAY"A;B;C;":END
290 PMODE3,1:SCREEN1,1:PSET(I,J,
B)
300 RETURN
1000 CLS
1003 PRINT"ENTER <p> FOR PROCES</p>
SED (COLOR) OR <u> FOR UNPROCESS</u>
ED B/W IMAGE"
1004 INPUT B\$:IF B\$="P" THEN GOT
O 1005 ELSE IF B\$="U" THEN GOTO
1020
1005 INPUT"COLOR SET <0 OR 1>";M
:INPUT" PMODE <3 OR 4>";L
1007 PMODEL,1:SCREEN1,M 1010 GOTO1010
1020 PMODE4,5:SCREEN1,1
1030 GOTO1030
2000 INPUT"FILE NAME"; V\$
2010 CSAVEM V\$,&H600,&H1DFF,&H60
0
2011 REM FOR DISK SYSTEM SUBSTIT
UTE THIS FOR LINE 2010 : SAVEM V
\$,PEEK(188)*256, PEEK(188)*25
6+(1536*4), PEEK(188)*256

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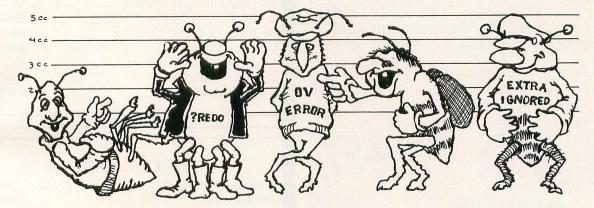
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I was, until I decided to write all these corrections (and more), once and for all, as a subroutine I could use in any program whenever I needed it.

I accomplished three major tasks with this subroutine: first, messages like ?REDO (from typing letters when numbers are required) and ?EXTRA IGNORED (from typing too many commas, or sometimes any at all) are no longer possible. Also gone are ?OV ERRORS generated by typing numbers of more than 38 digits.

Also, the Clear key is now completely ignored, so complex screens may rest in peace

Finally, the number of characters accepted per entry may be chosen by the main program simply by setting the buffer length variable BL. Characters typed after this limit is reached are ignored, and so are prevented from stumbling into important parts of the display.

by Richard Rutter

Line by Line

In Line 5000, string Z\$ is set to an empty string as keyboard characters will be stored by appending them to it. ZR and Z will become the floating point and integer values. CN is the character code for the cursor. BL is the buffer length and could be set to the needs of each program call, in which case it would not be set here.

Line 5010 is the start of an INKEY\$ loop which uses L\$ to get key values. Cursor colors start with yellow and end with orange, controlled by an automatic counter.

Line 5020 checks to see if the back-space key (Left Arrow) has been pressed. If so, a further check is made to see if a character can be deleted. When both conditions are satisfied, the rightmost character is deleted, and then erased by Line 5070. Line 5030 checks if the line erase key (Shift Left Arrow) has been pressed. If so, a string of backspaces is printed as long as the length of the input string plus one, so that the line and the cursor are erased. Everything starts over again at Line 5000.

Line 5040 is for when the user has

pressed Enter. A backspace is printed to erase the cursor, and control passes to Line 5080, which checks for numerical values. Line 5050 reacts to other character codes less than a blank space. For any of these characters, control passes back to the INKEY\$ loop in Line 5010. Line 5060 checks 'that the length of Z\$ will not exceed the desired buffer length. BL must never exceed 254 or an ?FC ERROR could occur in the line erase routine in Line 5030. If Z\$ is all right, L\$ is appended to it.

Line 5070 prints a backspace to erase the old cursor, the keyboard character is displayed on the screen, and a new cursor is placed after the new character. Control loops back to the INKEY\$ at Line 5010.

Line 5080 makes a last check to see if Z\$ is less than 38 characters long. If so, it sets the numerical value (VAL) from the string to ZR (real floating point value). Z gets a truncated integer value. Line 5090 returns Z\$, ZR, and Z to the calling routine in the main program.

Try the routine out before applying it to any of your programs. CLEAR at least 500 and then Enter GOSUB 5000. The routine terminates when you press Enter.

If you do use this routine in your programs, remember to pass parameters both ways. A typical calling line might look like: BL = 80: GOSUB 5000: TEXT\$ = Z\$: NUMBER = ZR: INVALUE = Z. Be sure your main program Clears enough string space.

Program Listing. Extended Color Basic

4090 'REQUIRES EXT. COLOR BASIC (BE SURE TO CLEAR >500 BYTES)
5000 Z\$="": ZR=0: Z=0: CN=159: B
L=240: PRINT CHR\$(CN);

5010 L\$=INKEY\$: TI=TI+1: IF TI>1 THEN TI=0: PRINT CHR\$(8);: CN=C N+16: IF CN>255 THEN CN=159: PRI NT CHR\$(CN); ELSEPRINTCHR\$(CN);

5020 IF L\$=CHR\$(8) THEN IF Z\$<>"
"THEN Z\$=LEFT\$(Z\$,LEN(Z\$)-1): G
OTO5070

5030 IF L\$=CHR\$(21) THEN PRINT S TRING\$(LEN(Z\$)+1,8);: GOTO 5000 5040 IF L\$=CHR\$(13) THEN PRINT C HR\$(8): GOTO 5080 5050 IF L\$<" " THEN 5010

5060 IF LEN(Z\$) < BL THEN Z\$=Z\$+L\$ ELSE 5010

5070 PRINT CHR\$(8) L\$ CHR\$(CN);:
GOTO 5010

5080 IF LEN(Z\$)<38 THEN ZR=VAL(Z \$): Z=INT(ZR)

5090 RETURN

Program Listing. Non-Extended Basic

4090 'WORKS W/ PLAIN COLOR BASIC BUT NEEDS MORE STRING SPACE.

(BE SURE TO CLEAR > 750 BYTES) 5000 Z\$="": KL\$=CHR\$(8): ZR=0: Z =0: CN=159: BL=240: PRINT CHR\$(C

N);
5010 L\$=INKEY\$: TI=TI+1: IF TI>1
THEN TI=0: PRINT CHR\$(8);: CN=C
N+16: IF CN>255 THEN CN=159: PRI
NT CHR\$(CN); ELSEPRINTCHR\$(CN);
5020 IF L\$=CHR\$(8) THEN IF Z\$<>"
" THEN Z\$=LEFT\$(Z\$,LEN(Z\$)-1): D
L\$=LEFT\$(KL\$,LEN(KL\$)-1): GOTO 5
070

5030 IF L\$=CHR\$(21) THEN PRINT K L\$;: GOTO 5000

5040 IF L\$=CHR\$(13) THEN PRINT C HR\$(8): GOTO 5080

5050 IF L\$<" " THEN 5010

5060 IF LEN(Z\$) < BL THEN Z\$=Z\$+L\$
: KL\$=KL\$+CHR\$(8) ELSE 5010

5070 PRINT CHR\$(8) L\$ CHR\$(CN);:
GOTO 5010

5080 IF LEN(Z\$)<38 THEN ZR=VAL(Z

\$): Z=INT(ZR)

5090 RETURN



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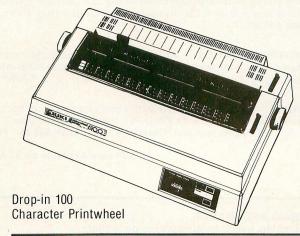
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PAGE PLUS — Attention BASIC programmers! Here is the software you've been waiting for! Up to 56K available from your BASIC programs. This utility, written by Chris Hawks, does the memory management necessary to utilize the two 32K banks of memory. Easy enough for any "intermediate" level BASIC programmer to use. Includes documentation and demo programs to show you how to use PAGE PLUS to get the most out of your computer. Works with 64K tape or disk systems. **Cassette \$27.95 Disk \$29.95**

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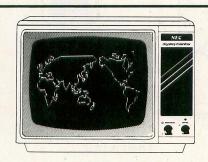
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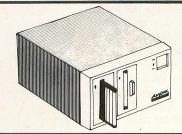
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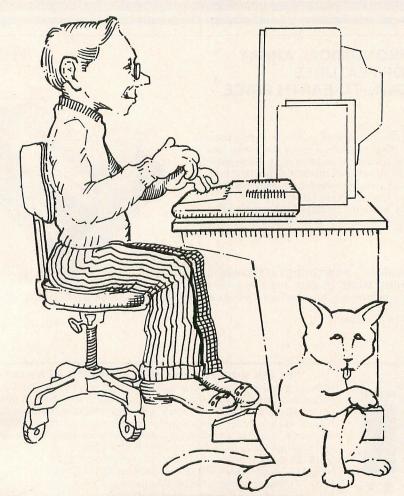


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Generic Tests







4K Color Basic

OME MONTHS BACK, I was working on a definition program where children would enter a word and then its definition, and the program would provide tests on it, or review, or it would be saved for a later date. When I finished I realized the program could be adapted to produce a test on any subject with a little work.

Here is that program. It is divided into seven sections: the first is instructions; the second lets you make up the list of questions. You can include answers if you want, or you can make up a list of general questions. For instance, the questions could be on states, i.e., capital, population and so on. For each state you would have different answers, but the questions would be the same. They are automatically loaded onto tape when you give the file name.

The next section retrieves the list from tape, and the next two sections let you review or test on them; the sixth section lets you put in new answers to the questions; the seventh section is the end.

by Robert Toscani

The Listing

Now that you understand what the program does, let's examine how it works. Program Listing 1 is for a 4K

Program Listing 1. Generic Test Program for 4K

- 1 CLEARO: CLEARMEM-500
- 3 CLS:PRINT@135,"1-NEW QUESTIONS
- ":PRINT@167,"2-LOAD FILE":PRINT@
- 199, "3-REVIEW": PRINT@231, "4-TEST
- ":PRINT@263,"5-NEW ANSWERS
- 6 INPUTC: IFC<1ORC>5THEN6
- 9 ONC GOTO12,78,111,159,132
- 12 CLS
- 15 INPUT"NR. OF QUESTIONS, (1-10
- 111 2
- 18 IFA<10RA>10THEN15
- 21 INPUT "ANSWERS Y/N"; E\$
- 24 FORB=1TOA

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27 PRINTB;: INPUTA\$(B) 33 IFE\$="N"THEN 42 36 INPUT "ANSWER"; D\$(B) 45 CLS:PRINT"POSITION TAPE FOR R ECORD, ENTER FILENAME" 48 INPUTC\$ 51 OPEN"O",#-1,C\$ 54 PRINT#-1, A, E\$ 57 FORB=1TOA 60 PRINT#-1, A\$(B) 63 IF E\$="N"THEN69 66 PRINT#-1, D\$(B) 69 NEXTB 72 CLOSE#-1 75 SOUND1,3:GOTO3 78 CLS:PRINT"POSITION TAPE FOR P LAY, ENTER FILENAME" 81 INPUTC\$ 84 OPEN"I", #-1,C\$ 87 INPUT#-1,A,E\$ 90 B=193 INPUT#-1,A\$(B) 96 IFE\$<>"N"THENINPUT#-1,D\$(B) 99 IFEOF(-1)THEN105 102 B=B+1:GOTO93 105 CLOSE#-1 108 SOUND50,3:GOTO3 111 CLS 114 FORB=1TOA 117 PRINTA\$(B) 120 PRINT"ANSWER: "D\$(B) 123 GOSUB201 126 NEXTB 129 GOTO3 132 CLS 135 FORB=1TO A 138 PRINTA\$(B) 141 INPUT "ANSWER-"; D\$(B) 150 NEXTB 153 INPUT"SAVE ON TAPE Y/N"; E\$ 156 IFE\$="Y"THEN45ELSEIFE\$="N"TH EN3ELSE153 159 G=RND(A) 162 PRINTA\$(G) 165 INPUT "ANSWER-"; G\$(G) 168 IFG\$(G)=D\$(G)THENPRINT"CORRE CT"ELSEPRINT" WRONG. THE CORRE CT ANSWER IS "D\$(G) 171 INPUT"ANOTHER Y/N"; H\$ 174 IF H\$="Y"THEN159ELSE3 201 PRINT"PRESS ANY KEY TO CONTI NUE" 204 IFINKEY\$=""THEN204 207 RETURN

Color Basic Color Computer, but Program Listing 2 should run on a 16K machine. Also, there is one place where the Extended Basic line input statement could be used. Listing 2:

Line 3 prints the menu. After each section is finished, that's the line you go back to. Line 6 makes sure your choice is in the menu, and Line 9 sends the program to the proper line.

Line 12 is the start of section two. It asks how many questions you want. I limited it to ten to avoid any possible problems with dimensioning. Line 21 lets you include answers. Line 27 prints the number of the question and asks for it. Line 30 lets you correct any mistake you might have made in the question, before moving on to the next one.

Line 33 checks to see if you are including answers. If so, Line 36 asks for the answer. Line 39 gives you the chance to correct the answer if you made a mistake. Line 42 sends you on to the next question.

When you have finished entering the test, Line 45 gives you instructions and Line 48 gets the file name. Line 51 opens communications to the cassette, 54 writes the number of questions and whether they will have answers, and Lines 57 – 69 write the questions and answers. Line 72 closes communications and Line 80 announces the test is saved, and sends you back to the menu.

Line 78 is the start of section three and again gives instructions. Line 81 gets the file name, 84 opens communications from the cassette, and 87 – 102 input the questions and answers. Line 99 checks for the end of the file. If it is reached, Line 105 closes the file. Line 108 lets you know the test has been loaded, and sends you back to the menu.

Lines 111 – 129 take the questions and answers and print them as a review. GOSUB 201 in Line 123 is a delay loop to let you proceed at your own pace. This ends section four.

Line 132 starts section six. Fooled you, didn't I? Thought this should be section five, right? Now we will see who is paying attention. Line 138 prints the questions and 141 asks you for the answer. Lines 144 — 147 let you correct the answer if you have made a mistake and Line 150 sends you to the next question.

When all the questions are done, Line 153 lets you save them on tape and Line 156 acts on your decision.

Now we come to section five, which begins with Line 159. This section merely picks a question at random, prints it in 162, and asks for the answer in Line 165. Line 168 checks the entered answer against the one in memory. It then tells

NUMBER OF QUESTIONS, UP TO 10? YOU INCLUDE ANSWERS Y/N? Y 1 ? WHO WAS THE STAR OF THE ED SULLIVAN SHOW? CORRECT Y/N? Y AND THE ANSWER IS ? ROY ROGERS CORRECT 7/N? 2 ? WHAT IS THE BEST COMPUTER? CORRECT Y/N? Y AND THE ANSWER IS ? COLOR COMPUT CORRECT Y/N? Y

you if your answer was right or wrong. Line 171 asks if you want to try another question, and 174 acts on your decision. Since the questions are picked by RND and there are no "already asked" flags, the same question may be asked more than once.

Lines 177 – 195 are the instructions in section one, and Line 198 is section seven, the end. Lines 201 - 207 are the GOSUB routine mentioned earlier.

The one problem with this program is that the answers you enter must exactly match those in memory or it will say you are wrong. However, it doesn't keep track of wrong answers.

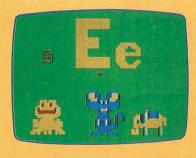
If you have Extended Basic you can change the Input commands in Lines 27, 36 and 141 to Line Input. This will allow greater freedom in the wording of the questions and answers.

For readers with 4K, I made several cuts so the program would fit. Gone are sections one and seven (Lines 177 – 198, the instructions and the end). Also gone are Lines 30, 39, 144 and 147. This means if you make a mistake you have to Break and start over when entering the questions and when answering. You must also press the Break key to exit the

Those changes are also reflected in Lines 3, 6 and 9. Some of the instructions have also been shortened. The net result is a program that takes up 1.1K, leaving about the same free to run the program.

The program can be used to build up a tape library of information that would be especially useful to families with more than one child. The first child will generate the quizzes, which could then be used by the other children as they grow up. Even if the program itself doesn't help in learning, looking up the information and entering it into the program makes it more likely the information will be retained than is likely if the student reads it in a book.

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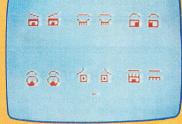
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> PRO-COLOR-FILE, PRO-COLOR-DIR, PRO-COLOR-FORMS (C) 1983

Derringer Software
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Program Listing 2. Generic Test Program for 16K

- 1 CLEAR200: CLEARMEM-800
- 3 CLS:PRINT@44, "OPTIONS":PRINT@1 35, "1-INSTRUCTIONS":PRINT@167, "2
- -NEW QUESTIONS": PRINT@199, "3-LOA
- D FILE": PRINT@231,"4-REVIEW": PRINT@263,"5-TEST": PRINT@295,"6-NEW
- ANSWERS":PRINT@327,"7-END" 6 INPUTC:IF C<1 OR C>7THEN6
- 9 ON C GOTO177,12,78,111,159,132,198
- 12 CLS
- 15 INPUT"NR. OF QUESTIONS, (LIMI T 10)"; A
- 18 IF A<1OR A>10THEN15
- 21 INPUT"WILL THERE BE ANSWERS (Y/N)"; E\$
- 24 FOR B=1TOA
- 27 PRINTB;: INPUT A\$(B)
- 30 INPUT"CORRECT (Y/N)";B\$:IF B\$
 ="Y"THEN33 ELSEIF B\$="N"THEN27 E
 LSE30
- 33 IF E\$="N"THEN 42
- 36 INPUT"AND THE ANSWER IS ";D\$(
- 39 INPUT"CORRECT (Y/N)";B\$:IF B\$
 ="Y"THEN 42 ELSEIF B\$="N"THEN 36E
 LSE39
- 42 NEXTB
- 45 CLS:PRINT"NOW, POSITION THE TAPE, PRESS <PLAY> AND <RECORD> AND ENTER A FILENAME."
- 48 INPUT C\$
- 51 OPEN"O",#-1,C\$
- 54 PRINT#-1,A,E\$
- 57 FOR B=1TOA
- 60 PRINT#-1, A\$(B)
- 63 IF E\$="N"THEN69
- 66 PRINT#-1,D\$(B)
- 69 NEXTB
- 72 CLOSE#-1
- 75 SOUND1,3:GOTO3
- 78 CLS:PRINT"PUT TAPE AT RIGHT S POT, PRESS <PLAY> AND ENTER TH
- E FILENAME."
- 81 INPUT C\$
- 84 OPEN"I", #-1,C\$
- 87 INPUT#-1,A,E\$
- 90 B=1
- 93 INPUT#-1,A\$(B)
- 96 IF E\$<>"N"THENINPUT#-1,D\$(B)
- 99 IF EOF(-1)THEN105
- 102 B=B+1:GOTO93
- 105 CLOSE#-1
- 108 SOUND 50, 3: GOTO 3

111 CLS
114 FORB=1TOA
117 PRINTA\$(B)
120 PRINT"ANSWER: "D\$(B)
123 GOSUB201
126 NEXTB
129 GOTO3
132 CLS
135 FOR B=1TOA
138 PRINTA\$(B)
141 INPUT"THE ANSWER IS ";D\$(B)
144 INPUT"CORRECT (Y/N)";F\$
144 INPUT CORRECT (Y/N)";F\$
147 IF F\$="Y"THEN150 ELSEIF F\$="
N"THEN141 ELSE144
150 NEXTB
153 INPUT"SAVE THEM ON TAPE (Y/N
)";E\$
156 IF E\$="Y"THEN45 ELSEIF E\$="N
"THEN3 ELSE153
159 G=RND(A)
162 PRINTA\$(G)
165 INPUT"ANSWER-";G\$(G)
168 IF G\$(G)=D\$(G)THENPRINT"CORR
ECT" ELSEPRINT"WRONG. THE CORREC
T ANSWER IS "D\$(G)
171 INPUT"ANOTHER (Y/N)"; H\$
174 IF H\$="Y"THEN159ELSE3
177 CLS:PRINT"THIS PROGRAM LETS
YOU CREATE CUSTOM QUIZZES AND
SAVE THEM ON TAPE WITH LITTLE E
FFORT. YOU CANASK UP TO 10 QUEST
IONS ON ANY SUBJECT. THE QUEST
IONS OR THE QUESTIONS AND ANSW
ERS CAN BE"
180 PRINT"STORED ON TAPE FOR TES
TING AND REVIEW OR USED FIRST.
THEY CAN BE SPECIFIC OR GENERAL
QUESTIONS"
183 GOSUB201
186 CLS:PRINT"TO MAKE A LIST OF
186 CLS:PRINT"TO MAKE A LIST OF QUESTIONS, PRESS 2. TO LOAD A
LIST ALREADY MADE, EITHER QUEST
IONS OR QUESTIONS AND ANSW
ERS, PRESS 3. TO REVIEW THE LIST
DRESS A TO REVIEW THE LIST
, PRESS 4. TO BE TESTED ON THEM,
PRESS 5. IF THE QUESTIONS DON'
T HAVE ANSWERS";
189 PRINT"YOU CAN ENTER AND SAVE
THEM WITH6. TO END, PRESS 7."
192 GOSUB201
195 GOTO3
198 CLEAR200: END
201 PRINT"PRESS ANY KEY TO CONTI
NUE"
204 IFINKEY\$=""THEN 204
207 RETURN

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Color Computing for Kids

Here's a review table for the last few months, and some new commands and games.

by Jean Plesser

ALWAYS TAKE A LITTLE time at the New Year to think back over the past year. This gives me a chance to recommit myself to projects as I make lists of new goals and ideas I want to carry into the new year. This made me think of a special list just for you — a review of all the BASIC symbols and commands I've covered since this series started. Refer to the review for anything you've forgotten, or, if you've joined us late, use it to learn what you've missed.

The "BASIC Review" gives us all a fresh start. I always begin a new year by putting things in order and filling my new calendar with dates to remember and promises to myself to make time for self-improvement. And, because I save all kinds of things (newspaper clippings and so on) through the year, I get some folders and large envelopes and go a little crazy with labels for awhile. The labels give me a system for filing so I'll know exactly where to look when I need an item quickly.

Your computer also uses a system of labels for organization, and that brings us to this month's lesson on *variables*. Variables are like labels for information (or data) you store in your computer's memory. You label and store data in a program either because it's used many times in the program or because the data changes and changing a variable's data is easier than changing the data in many lines throughout a program. You'll understand this better as we use variables, but first let's go over the rules for them.

Numeric Variables

To label numbers in a program you can use one or two letters. Any of the letters in the alphabet can be chosen. This program will show you how it's done:

10 CLS 20 A=20 30 NZ=10 40 PRINT "A = " A 50 PRINT "NZ = " NZ 60 PRINT "A + NZ = " A+NZ

When you RUN the program you'll see that the variable A holds, or represents, the number 20 and the variable NZ holds the number 10. The A and the NZ are "numeric variables" and the numbers 20 and 10 are "numeric data." Any letter could have been used in place of the A and any two letters could have been used in place of the NZ; choosing one or two letter variables is a personal choice — it's really up to you.

The numeric data can be PRINTed in any order you like and it can also be added (+), subtracted (-), multiplied (x), and divided (/). You can also change the data any variable holds without having to change any other line in the program. To change the data, just re-type the variable assignment lines (20 and 30), keeping the variables the same, but add your own numbers after the equals sign.

Now make any changes you want, then RUN the program after each change to see the difference. When you're through experimenting, type NEW and press the ENTER and CLEAR keys so you'll be ready for the next program.

Numeric Variables at Work

1984 is a leap year, giving us an extra day on February 29. If you're like me, with never enough time to do all the things you'd like, that can be a real gift. I think February 29 should be declared a holiday so we can really take advantage of having twenty-four extra hours of free time, but an extra day every four years is

still pretty terrific. Let's see...starting with 1984, how long before we experience an entire extra week?

4K Color Basic

The variable list for the program is:

Y = the leap year T = the number of years in-between D = the number of days in a week TY = the total number of years for an

And, here's the program:

10 CLS:PRINT

20 Y=1980:T=4:D=7

40 PRINT "EXTRA WEEK WHEN THESE"
50 PRINT "LEAP YEARS HAVE PASSED—"
60 FOR L=1 TO D
70 Y=Y+T
80 PRINT TAB(10) Y
90 NEXT L
100 TY=D*T

30 PRINT "WE WILL HAVE EXPERIENCED ONE"

110 PRINT "THAT WILL TAKE" TY "YEARS!!"
120 END

Line 10 clears the screen. The colon (:) separates statements on one program line, and the PRINT statement prints a blank line at the top of the screen.

Line 20 assigns values to the variables selected for the variable list.

Lines 30 to 50 PRINT the purpose of the program.

Line 60 is the beginning of the FOR/ NEXT loop that will repeat "D" times. The letter L is the loop's variable and the variable D equals seven, for the number of days in a week.

Line 70 calculates the leap year each time the loop repeats.

Line 80 is a PRINT TAB (), which indents the number of spaces within the parentheses () before the computer

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starts PRINTing. The new leap year is PRINTed each time the loop repeats.

Line 90 adds one to the loop's variable L, and sends the computer back to the FOR statement until L=D.

Line 100 calculates the total number of years.

Line 110 is a PRINT statement that will PRINT the value of TY in the middle of the sentence. Data within quotation marks ("") is called string data.

Line 120 tells the computer that your

program is finished.

RUN the program and compare the results with each statement so you can see what each line accomplished.

Have you noticed the answer to a computer calculation is put before the equals sign instead of after it? This gives the computer a variable before the calculations are done so the answer can be labeled and stored in memory. Numeric or string data mean nothing to the computer unless you first give it instructions on what to do with it.

How Many...How Long

Because this is the beginning of a year, let's look at some of the ways we spend time. If any of the numbers I've assigned to the variables are different for you, just replace them with your own numbers.

We all eat, some more than others, but on an average we eat three meals a day plus a couple of snacks. Let's see how many times we'll eat this year:

The variable list:

D = the number of days in 1984 M = the number of meals per day S = the number of snacks per day TE = total times we eat each year

Now, the program:

10 CLS:PRINT

20 D=366:M=3:S=2

30 TE=(M+S)*D

40 PRINT "IF I EAT" M "MEALS A DAY"

50 PRINT "AND" S "SNACKS, I WILL EAT-"

60 PRINT TAB(10) TE

70 PRINT "TIMES THIS YEAR!

Line 30 must be typed exactly as you see it. The computer calculates an equation from left to right, but it does the multiplication and division first, then goes back to do addition and subtraction. To prevent this you must use parentheses around the part of the problem you want calculated first. If we didn't use parentheses () here, the computer would multiply S x D and then add M—this answer would be 735 instead of the correct answer of 1830.

One thousand, eight hundred thirty!! And who says eating isn't America's favorite pastime?

How about sleeping? Do you put in nine hours of zzzzzz each night? Type NEW and we'll find out how much time you sleep in a year:

The variable list:

TS = the hours you sleep each night D = the number of days in a year YS = hours you sleep in a year

The program:

10 CLS:PRINT

20 TS=9:D=366:YS=TS*D

30 PRINT TAB(5) "IF I SLEEP" TS "HOURS"

40 PRINT "EACH NIGHT, I WILL SLEEP" YS

50 PRINT "HOURS THIS YEAR!!"

Type RUN. Three thousand two hundred ninety four hours! How many days is that?

Additions to the variable list:

H = hours in a dayTD = total number of days

Add these lines to your program:

60 H=24:TD=INT(YS/H)

70 PRINT TAB(10) "AND"

80 PRINT "THAT'S" TD "DAYS!!"

Line 70 has a command called an integer function. INT() simply tells the computer you don't want the answer to be a decimal, so the computer does the calculations inside the parentheses and chops off the decimal part of the number. With this function your answer will be 137 days instead of 137.25 days.

Do you want to find out how many weeks that is?

The variables:

W = the number of days in a week TW = the total number of weeks

And add these program lines:

90 W=7:TW=INT(TD/W) 100 PRINT TAB(6) "OR" TW "WEEKS!!!"

You now have enough information to use numeric variables in programs of your own. Using my examples, write programs to figure out how many hours you watch television in a year (that's hours each day times days in a year). How many video games do you play in a year? How many books will you read? And, if you get an allowance each week, how much money will you receive in a year? Just remember that there are 52 weeks and 12 months in a year.

I'm sure you'll soon have many ideas of

your own and you'll find your computer is not only fun but helpful.

String Variables

The rules for making string variables are the same as for numeric variables, but a dollar sign (\$) is always added. When you see the \$, say "string," not "dollar," and remember that string data is anything that you put inside quotation marks.

To see how string variables work, let's turn your computer into a comedian. Type NEW, then enter this program:

10 CLS:PRINT

20 S\$="?":K\$="KNOCK!KNOCK!"

30 A\$="WHO'S THERE?"

40 R\$="BANANA.":SA\$="WHO?"

50 FOR J=1 TO 2

60 PRINT K\$:PRINT A\$:PRINT R\$

70 PRINT R\$;" ";"SA\$

80 FOR L=1 TO 31

90 PRINT S\$;

100 NEXT L

110 NEXT J

120 PRINT K\$:PRINT A\$:PRINT "ORANGE."

130 PRINT "ORANGE " SA\$

140 PRINT "AREN'T YOU GLAD I DIDN'T SAY "; R\$

150 PRINT "AGAIN?"

After you RUN this program you'll see the reason for the J loop repeating twice and how the L loop PRINTs a line of question marks. The string data will also be clear to you if you compare the program lines to the printout.

To try "Knock, Knock" jokes of your own, put the word you want to use in R\$ and delete Line 50 and Lines 80 through 150. You delete a line by typing the line number, then pressing the ENTER key.

Adding String Data

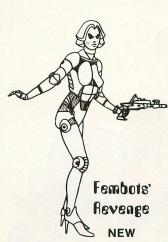
String variables can contain numbers also, but arithmetic cannot be done with string data. You must use numeric data for calculations, but you can add strings together. Adding strings means putting string data together using the plus sign. This creates a variety of PRINT statements.

The following "Mix-Up" program comes from my almost ten-year-old son David's imagination. It will give you lots of practice adding and PRINTing string variables.

The program has six categories of variables, separated by REMark statements. Each category has six choices and the PRINT statements are made up by using one variable from each category. The variables are added together using the

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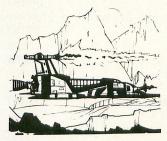


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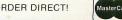


The King of Pac games is here. This fast-paced maze-chase game will challenge the most skilled. You guide The Nibbler through the maze, the portals, onward to the Energy Pills. Then the Ghouls, constantly at your heels, will end up in your belly! The better you get the better you have to become to master the blazing speed. You haven't pushed your skill until you've tried this one!

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plus sign and the results are silly mixedup sentences.

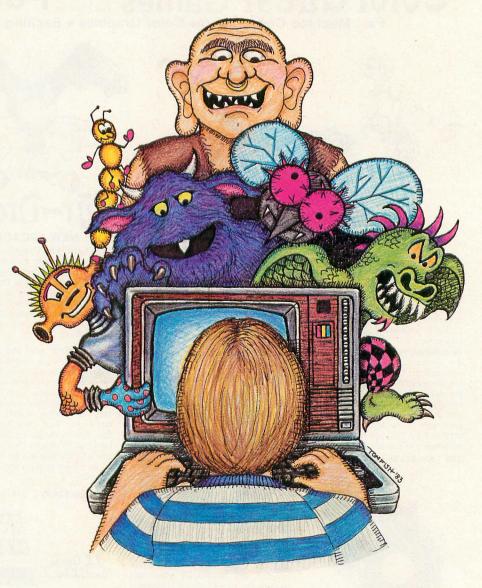
The PRINT statements start with Line 500; there are two statements for each sentence; and, a blank line is PRINTed between. I've given you an example using four different sentences, but in the future you can create your own.

Each time you RUN the program change Lines 500 through 600 using a variable from each category. Select one variable from: AA\$ to AF\$; BA\$ to BF\$; CA\$ to CF\$; DA\$ to DF\$; EA\$ to EF\$; and FA\$ to FF\$. Don't forget to put the plus sign between variables in the PRINT statement, and for the most fun don't look back at the words. Then when you RUN the program your sentences will be silly surprises.

Before you type the "String Mix-Ups" program (Program Listing 1), notice the space before the last quotation mark in all but the last category of variables. The spaces are there to separate the words, so be sure to use them. Also, when you SAVE this program, delete the PRINT statements first so you'll always get a new start each time you load it. And if you get ideas of your own, change the variables or try your own programs.

This lesson on numeric and string variables is leading up to some fun and exciting programming, so get lots of practice. Next month we'll talk back to our computers with the INPUT statement, and also learn to store lots of data in one variable — the DIM statement.

Have a happy, healthy new year and until next month — keep your computer's memory bank full of variables.



BASIC Review

Keyboard Characters and Symbols:

ENTER Tells the computer you've ended a line.

BREAK Stops a running program.

CLEAR Clears the screen and returns the cursor to the upper left corner.

SHIFT @ Pauses your running program. Press any key to continue.

SHIFT "Left Arrow" Erases an entire line if ENTER has not been pressed.

"Left Arrow" Backspaces the cursor and erases one character at a time. Means the same as the command PRINT.

- : Separates statements on a line.
- ; Tells the computer to continue PRINTing on the same line.

- + Addition, and also combines strings.
- Subtraction.
- × Multiplication.
- / Division.
- () Tells the computer to do what's inside first.

BASIC Commands:

CLS Clears the screen with green.

CLS () Clears the screen with the color indicated by the number inside the parentheses.

CLOAD Loads a program from tape.

CSAVE Saves a program to tape. **END** Tells the computer to end your program.

FOR/NEXT Creates a loop in a program that the computer will repeat the number of times indicated.

GOTO Sends the computer to the line number indicated.

LIST Lists a program on the screen. **LLIST** Lists a program on the printer.

PRINT Tells the computer to print whatever follows.

PRINT @ Prints at a specific screen location.

PRINT TAB Indents the number of spaces indicated within parentheses ()

PRINT #-2 Prints on the printer.

REM A remark statement that the computer ignores.

RESET Resets a point to black.

SET Sets a point on the screen at the position and color specified.

SOUND Sounds a specified tone for the duration of time specified.

STEP Causes the FOR/NEXT loop to count by the number that follows the word STEP.

Program Listing. String Mix-Ups

- 10 REM -- STRING MIX-UPS
- 20 REM -- "A" CATAGORY
- 30 AA\$="THE MONSTER
- 40 AB\$="THE BUG"
- 50 AC\$="AN ALIEN
- 60 AD\$="THE FLY "
- 70 AE\$="THE DRAGON"
- 80 AF\$="THE OGRE "
- 90 REM -- "B" CATAGORY
- 100 BA\$="HAD ROUND"
- 110 BB\$="HAD FURRY "
- 120 BC\$="HAD PRICKLY
- 130 BD\$="HAD FUZZY "
- 140 BE\$="HAD SCALEY"
- 150 BF\$="HAD CROOKED"
- 160 REM -- "C" CATAGORY
- 170 CA\$="TOES"
- 180 CB\$="EYES"
- 190 CC\$="FINGERS"
- 200 CD\$="HAIR"
- 210 CE\$="ELBOWS"
- 220 CF\$="TEETH "
- 230 REM -- "D" CATAGORY
- 240 DA\$="ON"
- 250 DB\$="AND"
- 260 DC\$="WITH 17 "
- 270 DD\$="OVER"
- 280 DE\$="UNDER"
- 290 DF\$="AROUND"
- 300 REM -- "E" CATAGORY
- 310 EAS="PURPLE "
- 320 EB\$="POLKA DOTTED
- 330 EC\$="CHECKERED
- 340 ED\$="10 "
- 350 EE\$="POINTED"
- 360 EF\$="INVISIBLE"
- 370 REM -- "F" CATAGORY
- 380 FA\$="FEET!"
- 390 FB\$="SKINNY LEGS!"
- 400 FC\$="HANDS!"
- 410 FD\$="KNOCKED KNEES!"
- 420 FE\$="ELBOWS!"
- 430 FF\$="ELONGATED EARS!"
- 440 CLS:PRINT:PRINT
- 450 REM -- PRINT STATEMENTS--
- 500 PRINT AA\$+BD\$+CB\$
- 510 PRINT DE\$+EC\$+FF\$
- 520 PRINT
- 530 PRINT AC\$+BA\$+CF\$
- 540 PRINT DB\$+ED\$+FD\$
- 550 PRINT
- 560 PRINT AF\$+BE\$+CA\$
- 570 PRINT DD\$+EA\$+FB\$
- 580 PRINT
- 590 PRINT AD\$+BB\$+CE\$
- 600 PRINT DA\$+EF\$+FC\$

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How To Remember Not To Forget

Keep your computer's eye on important dates and forget the worries that stem from human memory lapse.

ERE ARE SUBROUTINES that will make your date conversions and manipulations less painful. They can be used in any Basic program that requires date manipulations or conversions. These routines will run on any Color Computer with Extended Color Basic.

The subroutines let you change a date from a numeric Julian date to a string MM/DD/YY format and vice versa. The routines will also reduce a Julian date after an add routine (more on that later), and change a month to the Julian day of the first of that month. The routines are numbered beginning with Line 50000 so they can be easily merged with Basic programs that use lower line numbers.

The first subroutine (Lines 50000 – 50140) changes an MM/DD/YY format date into a Julian date. Store the incom-

by Norman Garrett



16K Extended Color Basic

ing date as variable XX\$. The result (a Julian date) is then stored as variable XD, in the format YYDDD. You can then perform addition using the date.

The second subroutine (Lines 50260 – 50540) does the opposite. It changes variable XD (the Julian format date) and output variable XD\$ (MM/DD/YY format)

The second subroutine (Lines 50830 -50900) reduces a Julian date after a mathematical operation has been performed on it. Since Julian dates are not really decimal numbers, a special routine is needed after they're adjusted. For example, if you want to increment a Julian date (XD) of 83250 (the 250th day of 1983, or September 7, 1983) by 180 days, you would do something like this: 150 XD=XD+180. If XD=83250, the result would be 83430. Since no day above 365 (366 for leap year) is possible, this is an invalid date. This routine would take your date (XD) and adjust it to a valid date. The result of this example would be XD= 84065 (March 6, 1984). The value of XD is changed as a result of the subroutine execution. Note: this routine is not designed to handle subtractions. Subtracting dates requires a completely different

Program Listing. Date Conversions

	49991	' DATE SUBROUTINES
	49992	BY NORMAN GARRETT
	50020	'CONVERT TO JULIAN
	50025	'XX\$=INCOMING DATE
	50030	'MM/DD/YY FORMAT
	50040	'XD=JULIAN DATE
	50055	XY\$=RIGHT\$(XX\$,2)
	50060	XD=VAL(XY\$):XD=XD*1000
	50065	W1\$=LEFT\$(XX\$,2)
	50070	IF RIGHT\$(W1\$,1)="/" THEN
	50080	
	50075	GOTO 50085
	50080	W1\$=LEFT\$(W1\$,1)
	50085	W1=VAL(W1\$)
888		

```
50090 GOSUB 52000

50095 W2$=RIGHT$(XX$,5)

50100 IF LEFT$(W2$,1)="/" THEN 5

0110

50105 GOTO 50120

50110 W2$=MID$(W2$,2,1)

50115 GOTO 50125

50120 W2$=LEFT$(W2$,2)

50125 W2=VAL(W2$)

50130 XD=XD+W2+W1

50135 NG=INT((XD/1000)*1000):IF

XD-NG > 365 THEN GOSUB 50830

50140 RETURN
```

algorithm. These subroutines are designed to be used only in situations where dates need to be incremented. As a general rule, the Julian date reduction subroutine should be executed before converting a Julian date to MM/DD/YY format.

The fourth subroutine (Lines 52005-52125) is used internally, but may also be of value to the user. It translates a month to the number of days preceding it during that year (+1). This lets the computer calculate Julian dates. The input to this routine is W1. Note that a month greater

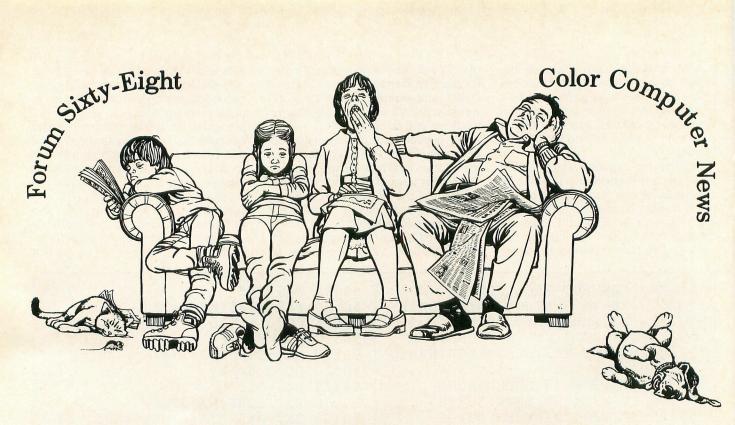
than 12 will return a value of zero in W1. For example, if I had a value of 14 stored in W1, and executed GOSUB 52005, W1 would contain a value of zero after return from the subroutine.

The possible uses of these date routines are endless. I originally developed them for an auto maintenance program which kept track of items such as when the next oil change was due. There are also many accounting applications where they will be useful.

As noted before, these routines have their limitations. While possibilities for

bells and whistles abound, the routines only perform minimal date editing. Incoming dates should be edited first in the driver program. Also, leap years are not accounted for. If they really matter, you can build a table of leap years. You might also consider a conversion to JAN-DEC format (three character month designations) or even full date formats. As the routines stand, though, they will certainly get the job done with a minimum of bother and ought to come in handy with some of your programming efforts.

```
50270 'CONVERT FROM JULIAN
                                     50495 W4$="9"
50280
     'XD=INCOMMING JULIAN DATE
                                     50500 W5$=STR$(W3-243)
50290 'XX$=MM/DD/YY OUTPUT
                                     50505 GOTO 50535
50295 W3$=STR$(INT(XD/1000))
                                     50510 W4$="10"
50300 NG=INT(XD/1000)*1000:W3=XD
                                     50515 W5$=STR$(W3-273)
-NG
                                     50520 GOTO 50535
50305 IF W3 < 32 THEN 50375
                                     50525 W4$="11"
50310 IF W3 < 60 THEN 50390
                                     50530 W5$=STR$(W3-304)
50315 IF W3 < 91 THEN 50405
                                     50535 XX$=W4$+"/"+RIGHT$(W5$,LEN
50320 IF W3 < 121 THEN 50420
                                     (W5\$)-1)+"/"+RIGHT\$(W3\$,LEN(W3\$)
50325 IF W3 < 152 THEN 50435
                                     -1)
50330 IF W3 < 182 THEN 50450
                                     50540 RETURN
50335 IF W3 < 213 THEN 50465
                                           'REDUCE JULIAN DATE
                                     50840
50340 IF
        W3 < 244 THEN 50480
                                     50850
                                           'XD=JULIAN DATE
50345 IF W3 < 274 THEN
                        50495
                                     50860 NG=(INT(XD/1000)*1000):W6=
50350 IF W3 < 305 THEN 50510
                                     XD-NG
50355 IF W3 < 335 THEN 50525
                                     50870 IF W6<365 THEN 50900
50360 W4$="12"
                                           IF W6 < 730 THEN 50890
                                     50875
50365 W5$=STR$(W3-334)
                                     50880 XD=XD+2000
50370 GOTO 50535
                                     50885 XD=XD-730:GOTO 50900
50375 W4$="1"
                                     50890 XD=XD+1000
50380 W5$=STR$(W3)
                                     50895 XD=XD-365
                                     50900 RETURN
50385 GOTO 50535
50390 W4$="2"
                                           'TRANSLATE MONTH TO DAYS
                                     52010
50395 W5$=STR$(W3-31)
                                           'W1=NUMERIC MONTH (1-12)
                                     52020
50400 GOTO 50535
                                     52030
                                           'Wl=DAYS (OUTPUT)
50405 W4$="3"
                                           'IF W1>12 THEN DAYS=0
                                     52040
50410 W5$=STR$(W3-59)
                                           IF W1>12 THEN 52120
                                     52045
                                           IF W1<1 THEN 52120
50415 GOTO 50535
                                     52050
50420 W4$="4"
                                          IF W1=1 THEN W1=0
                                     52055
50425 W5$=STR$(W3-90)
                                          IF W1=2 THEN W1=31
                                     52060
50430 GOTO 50535
                                     52065 IF W1=3 THEN W1=59
50435 W4$="5"
                                              W1=4 THEN W1=90
                                     52070
                                           IF
50440 W5$=STR$(W3-120)
                                     52075
                                           IF W1=5 THEN W1=120
50445 GOTO 50535
                                           IF W1=6 THEN W1=151
                                     52080
50450 W4$="6"
                                     52085 IF
                                              W1=7 THEN W1=181
50455 W5$=STR$(W3-151)
                                     52090
                                           IF
                                              W1=8 THEN W1=212
50460 GOTO 50535
                                     52095 IF
                                              W1=9 THEN W1=243
                                     52100 IF W1=10 THEN W1=273
50465 W4$="7"
                                     52105 IF W1=11 THEN W1=304
50470 W5$=STR$(W3-181)
                                     52110 IF W1=12 THEN W1=334
50475 GOTO 50535
50480 W4$="8"
                                     52115 GOTO 52125
50485 W5$=STR$(W3-212)
                                     52120 W1=0
50490 GOTO 50535
                                     52125 RETURN
```



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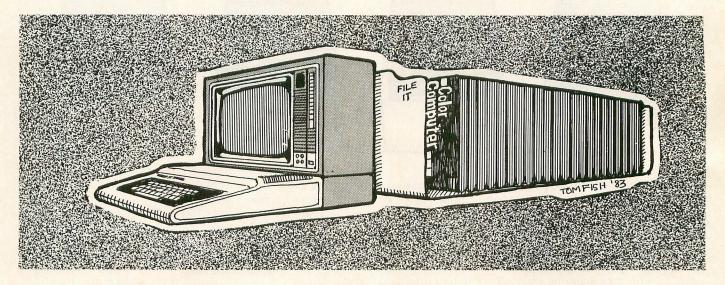
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File It





16K Color Basic

HE COLOR COMPUTER and the TDP 100 are truly fine computers. If you were fortunate enough to receive one as a gift, thank your lucky stars. If you purchased your Color Computer, you most likely comparisonshopped and know you made a good buy. No matter how you got it, be glad for it: after all, it could have been one of those game machines, instead.

Yes, I know the Color Computer is an excellent machine to play games on. I'm sure everyone enjoys playing a good game every now and then, as I do. However, you are probably beginning to ask yourself if game playing is all computing is about.

The answer is a dramatic no! Computing and your Color Computer can do many things: you can purchase program software on a wide variety of subjects from games to sophisticated scientific problem solving. You can also write your own programs.

One of the biggest problems for most beginning computerists who want to leave game playing behind and begin writing programs is having to first sort through the great volume of information available. Wouldn't it be nice if you could sort through several magazine articles to

by Keith Baker

find those that dealt with the type of program you wanted to write?

Well, why not let your computer help you? File It will be glad to help you sort, categorize, and generally keep track of almost anything.

What File It Does

File It is one of a type of program commonly called a database manager (DBM). This is a generic term for a family of programs designed to let the user perform a number of activities associated with record-keeping. Some of these activities include sorting, editing, selectively searching, and retrieving data. Of course, there must also be a means of printing and storing the data files.

File It performs these functions, as well as providing several other convenient operations. This program will let you create a file containing five fields of information. You may specify the names of the fields you use.

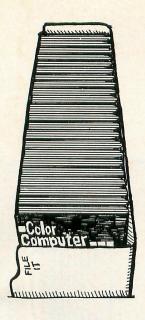
Once you have created the file you can perform alphabetic or numeric sorts on three fields. You can also search for specific data in one of four fields. There are also file maintenance functions, including adding file entries, deleting file entries, and changing existing files. Additional features include viewing the file entries in either a forward or reverse direction, hard copy printout, and file storage on cassette tape.

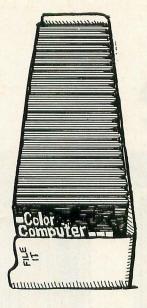
How To Use File It

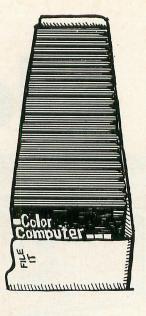
Type the program into your computer and CSAVE several copies. Then if you make a typing error and your program is destroyed, you will have a back-up tape to use when debugging typing errors.

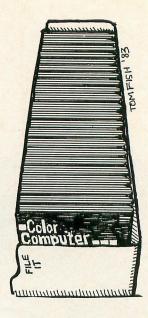
As soon as your monitor gives you the OK prompt, you're ready to use the program. Type RUN and press Enter. You should see a title page announcing the title of the program, etc. You will then be asked if you wish to load an existing file tape. Since you have not yet created one of these, hit the N key. This will advance you to the field naming routine.

Give this portion of your program a little thought before going on. You are asked to name five fields; each of these









fields is related. Let's say you name the first field "Article Name." The second through fifth fields should then have something to do with articles. For example, field two could be called "Article Type." The third and fourth fields could be "Author" and "Article Source." Finally, the fifth field might be "Subject." These field names are just examples, of course. One of the nice things about this program is that you can give the fields any name you like.

This process does not have to be performed each time you use the program. If you had entered Y in response to the question concerning loading an existing file tape, the program would read your tape and automatically reassign the field names you used when you created the file

File It will now advance you to the main menu. You have six options, including file maintenance, file search, file sort, file print, file save, and file view. Select option 1, File Maintenance.

A submenu will appear presenting three choices. You can add a file, delete a file, or edit a file. I should mention a fourth choice; you can always return to the main menu from any submenu by pressing the R key.

Select function 1, Add File, so you can begin building your data file.

There are two operational conditions to think about as you develop your file. The program as it is now written allows search operations on fields 1, 2, 3, and 4. These fields should contain the information you want to use as specific identifiers.

Also, the sort routine is designed for fields 1, 2, and 3. These fields should contain the information you want to organize alphabetically or numerically.

File It is written entirely in Basic for

ease in making modifications to the program. This can make the sort routine slow at times, if large fields are used in the sort categories. Careful selection of the sort fields will minimize this potential drawback.

This program is easy to use and to modify. I hope you will enjoy it.

Line By Line

Line 0 and 654—PCLEARs all but one graphic page to provide free memory for users with Extended Basic.

Lines 4 – 14—Program name and author information.

Line 16—Clears string space and dimensions 50 data arrays for each field. File It takes up approximately 8500 bytes of memory, leaving approximately 7500 bytes available to store information. However, because the Color Computer uses a number of bytes in low memory as string descriptors, less space is actually available. The descriptors tell Basic where to find the data you input as strings. The clear and dimension statements I have used should work for 16K machines. However, as your data file grows beyond the 50 enterto maximize memory use.

Line 20—Defines strings comprising screen displays.

Lines 22 – 32—Displays title page. Line 22 provides timing for the screen display. Lines 34 – 42—Load existing file tape? Directs program flow upon decision.

Lines 44 – 54—Field naming routine. Lines 56 – 78—Presents main menu and directs program flow upon choice.

Lines 80 –104—Presents file maintenance submenu and directs program flow upon decision.

Lines 106 – 158—Add a file entry routine.

Lines 160 – 198—Delete a file entry routine.

Lines 200 – 252—File editing routine.

Lines 254 – 446—Data field search routine. BA\$ = Field 1. BB\$ = Field 2. BC\$ = Field 3. BD\$ = Field 4.

Lines 448 - 514—Field sorting routines. A\$ = Field 1. B\$ = Field 2. C\$ = Field 3. Lines 516 - 540—Save routine saves

data file to tape. Lines 542 – 572—Load routine loads existing data file from tape.

Lines 588 – 608—Print routine. 590 checks to see if printer is on-line. 594 centers file title. 598 prints column headings. 604 prints file entries.

Line 610 – 618—Keeps field entries together during sorting.

Lines 620 – 650—View routine, prints file entries to screen.

Modifications—Non-Extended Basic users delete lines 2 and 654. If not using printer option, delete line 66 and lines 588 – 608, and change line 68 from 6 to 5; line 76 from 6 to 5; and delete the number 588 from line 78.

Modifying File It

File It is easily modified. I see several areas that are logical targets for change.

The first change I wanted to make was to increase the number of fields in a file entry. To do this, you need only add one more variable to the various input, output, and data handling functions. For example, to add a new field, follow the steps listed below:

• Add BF\$ to the field naming routine (lines 44 – 54). New line 55.

- Add BF\$ to the add file routine (lines 110 – 126). New line 127.
- Add r\$ to the add file routine (128 140). New line 141.
- Add F\$(RN-RN) to the delete file routine in 188.
- Add F\$(X)=F\$(X+1) to the delete file routine in 192.
- Change line 228 in the edit function to L=VAL(L\$):If L <1 or L> 6 THEN 224 ELSE 230.
- Add ,241 to the edit function line 230.
- Add new line 241:PRINT BF\$":"F\$(RN): PRINT:INPUT"CHANGETO:" ;F\$(RN):GOTO242
- Add, BF\$ to the save file routine in 532.
- Add ,F\$(X) to the save file routine in 536.
- Add .BF\$ to the load file routine in 562.
- Add ,F\$(X) to the load file routine in 568.
- Add a new line 583 to the display routine (574 582). New line: PRINT" 6: "F\$(RN)
- Add a new tab location (see modifying printout) and BF\$ to line 598.
- Add a new tab location and F\$(X) to line 604.
- Add T\$(6)=F\$(A1) to line 612.
- Add F\$(A1)=F\$(A3) to line 614.
- Add F\$(A3)=T\$(6) to line 616.
- Add a new line to the view file routine (624 634). New line: 635 PRINT BF\$": "F\$(X)

Another modification might be to add or change the field used for searching. To make this modification, all that is necessary is to change the search submenu in lines 258 – 266 and the corresponding search routine.

To be able to search for field 5 (BE\$) instead of field 4 (BD\$), change BD\$ in 264 to BE\$, and also change BD\$ in 392 and 396 to BE\$. To complete the modification change D\$ to E\$ in 398 and 406.

The sorting routine can be changed in almost the same fashion. First change the sort submenu in lines 426 – 432. Then change line 458, 482, or 504 to the field on which you want to sort.

One other major modification comes to mind. The heart of a data base manager is the ability to obtain a print out of the information in a format you choose. To make changes in the print format the user must be familiar with the commands used by his printer and with the basics of the tab function.

File It, as it is now written, relies on only the most basic formatting requirements. An 80-character per line printer is required. Since there are five fields of data for each file, the 80 characters of printer width are divided by five to determine the number of character spaces that can be used in each column. The result is 16 characters per column. This produces all the columns at the same width. However, so long as we remember that if we add more characters to a fields column we have to take some away from one of the others, this isn't important. Remember, there are only 80 spaces total available.

The print out's title is the title assigned to the file when a copy is saved to tape.

If you print a file without first saving a copy to tape, no title will be printed. This was done to remind you to save a copy of your file before turning off your computer. I hate having to retype data entries, don't you?

The title is centered on the page by lines 594 and 596. Line 594 counts the number of characters in the title and divides it by two. It then counts back from the center of the page (40) by half the title's width and sets a tab. Line 596 tabs to the location set by 594 and prints the title

The column headings are the same as the field entry titles. These are positioned over the data columns by the tab settings in line 598. The columns are 16 characters wide with the exception of column five, which is only 12 characters wide. The first column is set in four spaces from the left edge of the page. Therefore, four character spaces are deleted from the right side.

The data columns are also 16 characters wide. However, they are set in from the edge of the page by only three character widths. Since each of the headings and data entries is left-justified in its column, the image of centering is achieved.

Modification is simply a matter of adjusting the tab locations to achieve column widths that meet your requirements. As with all programming efforts, attention to detail is the main thing to keep in mind when making modifications. Don't be afraid to give it a try.

Program Listing. File It

2 GOTO654
4 REM # FILE IT #
6 REM #DATA MANAGEMENT PROGRAM#
10 REM# BY KEITH BAKER #
12 REM# #
14 REM# #
16 CLEAR5500:DIMA\$(50),B\$(50),C\$
(50),D\$(50),E\$(50)
18 CLS3
20 S\$=" "+STRING\$(30,"*"):R\$=STR
ING\$(80,"*"):U\$=" *"+STRING\$(28,
" ")+"*"
22 FORX=1TO50
24 PRINT@160,S\$:PRINT@192,"
FILE IT"
26 PRINT@224," DATA MANAGEME
NT PROGRAM"
28 PRINT@256," BY KEITH
BAKER"
30 PRINT@288,S\$

```
32 NEXTX
34 CLS:PRINT@224,"
                         LOAD AN
EXISTING FILE?":PRINT@256, "PRESS
 <Y> FOR YES OR <N> FOR NO."
36 L$=INKEY$:IFL$=""THEN36
38 IFL$="y"ORL$="Y"THEN542
40 IFL$="n"ORL$="N"THEN 44
42 GOTO 36
44 CLS: PRINT"
                  FIELD NAMING FU
NCTION": PRINT: PRINT
46 LINEINPUT"FIELD 1 NAME:";BA$
  LINEINPUT"FIELD 2 NAME:"; BB$
50 LINEINPUT"FIELD 3 NAME:";BC$
52 LINEINPUT"FILLD 4 NAME:";BD$
54 LINEINPUT"FIELD 5 NAME:"; BE$
56 CLS3:PRINT@96,S$:PRINTU$
58 PRINT" *
                1> FILE MAINTAINC
E
60 PRINT" *
                2> SEARCH FILE
                              ▶ more
```

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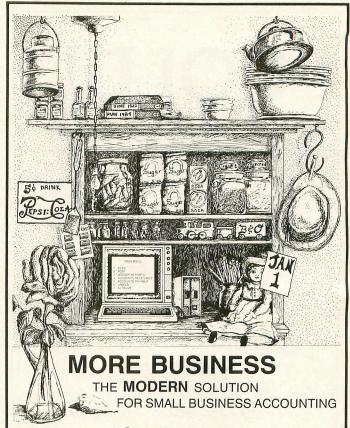
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```
62 PRINT" *
               3> SORT FILE
       * 11
64 PRINT" *
               4> SAVE FILE
66 PRINT" *
               5> PRINT FILE
       * 11
68 PRINT" *
               6> VIEW FILE
70 PRINTUS: PRINTSS: PRINT"
                             "REC
" FILE/S NOW IN MEMORY":SOUND220
72 L$=INKEY$:IFL$=""THEN72
74 L=VAL(L\$)
76 IFL<1ORL>6THEN72ELSE78
78 ONL GOTO80, 254, 424, 516, 588, 62
80 REM FILE MAINTAINCE
82 CLS3:PRINT@160,S$:PRINTU$
84 PRINT" *
               1> ADD FILE
       * "
86 PRINT" *
                2> DELETE FILE
       * "
88 PRINT" *
               3> EDIT FILE
       * "
90 PRINT" *
                R> RETURN MAIN ME
       *"
NU
92 PRINTUS: PRINTS$
94 SOUND 220,1
96 L$=INKEY$:IFL$=""THEN96
98 IFL$="r"ORL$="R"THEN56
100 L=VAL(L$)
102 IFL=1ORL=2ORL=3THEN104ELSE96
104 CLS:ONL GOTO106,160,200
106 REM ADD A LISTING
108 REC=REC+1
110 CLS1: PRINTS$
112 PRINT" *
                    ADD A FILE
114 PRINTS$
116 PRINT"
                   FILE NUMBER: "R
EC: PRINT
118 PRINT"ENTER "BA$" :";:LINEIN
PUTA$ (REC)
120 PRINT"ENTER "BB$" :";:LINEIN
PUTB$ (REC)
122 PRINT"ENTER "BC$" :";:LINEIN
PUTC$(REC)
124 PRINT"ENTER "BD$" :"::LINEIN
PUTD$(REC)
126 PRINT"ENTER "BE$" :";:LINEIN
PUTE$(REC)
128 CLS
130 PRINT"
                  FILE NUMBER: "R
```

EC: PRINT 132 PRINTBA\$" :"A\$(REC) 134 PRINTBB\$" : "B\$(REC) 136 PRINTBC\$" :"C\$(REC) 138 PRINTBD\$" :"D\$(REC) 140 PRINTBES" : "E\$(REC) 142 PRINT: PRINT" IS THIS CORRECT (y/n)" 144 AN\$=INKEY\$:IFAN\$=""THEN144 146 IFAN\$="y"ORAN\$="Y"THEN150 148 IFAN\$="n"ORAN\$="N"THENRN=REC :CLS:GOTO220 150 CLS3:PRINT@192," INPUT <A> ANOTHER OR <R> RETURN TO MENU" 152 L\$=INKEY\$:IFL\$=""THEN152 154 IFL\$="a"ORL\$="A"THENREC=REC+ 1:GOTO110 156 IFL\$="r"ORL\$="R"THEN56 158 GOTO152 160 REM DELETE A FILE 162 CLS(7):PRINT@0,"ENTER <R> TO RETURN TO MAIN MENU": PRINT@192, S\$ 164 PRINT" DELETE A FIL E 166 PRINTS\$ 168 PRINT: INPUT" FILE NUMBER TO BE DELETED: "; RN\$ 170 IFRN\$="R"ORRN\$="r"THEN56ELSE 172 172 RN=VAL(RN\$):IFRN>REC ORRN<1T HEN162 174 CLS:PRINT@32," DELE TE FUNCTION": GOSUB574 176 PRINT" CORRECT LISTING (y/n) 178 L\$=INKEY\$:IFL\$=""THEN178 180 IFL\$="y"ORL\$="Y"THEN188 182 IFL\$="n"ORL\$="N"THEN160 184 IFL\$="r"ORL\$="R"THEN56 186 GOTO178 188 A\$(RN)=A\$(RN-RN):B\$(RN)=B\$(RN-RN):C\$(RN)=C\$(RN-RN):D\$(RN)=D\$(RN-RN):E\$(RN)=E\$(RN-RN)190 CLS:FORX=1TO100:PRINT@232,"R ECORD DELETED": NEXTX: FORX=RN TOR EC 192 A\$(X)=A\$(X+1):B\$(X)=B\$(X+1):C\$(X)=C\$(X+1):D\$(X)=D\$(X+1):E\$(X)=E\$(X+1)194 NEXTX 196 REC=REC-1:IFREC<1THENREC=0 198 GOTO56 200 REM EDIT A FILE

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204 PRINT" *

EDIT A FILE

206 PRINTS\$

208 PRINT: INPUT" FILE NUMBER TO BE EDITED: "; RN\$

210 IFRN\$="R"ORRN\$="r"THEN56ELSE 212

212 RN=VAL(RN\$):IFRN<1ORRN>REC T HEN214ELSE218

214 CLS:FORX=1TO100:PRINT@256,"
RECORD NUMBER OUT OF RANGE":NE

216 GOTO56

0

M

U

T

E

R

218 CLS: PRINT@32,"

ED

IT FUNCTION"
220 GOSUB574

222 PRINT" EDI

EDIT WHICH FIELD

?"
224 L\$=INKEY\$:IFL\$=""THEN224

226 IFL\$="r"ORL\$="R"THEN56

228 L=VAL(L\$):IFL<1ORL>5THEN224E LSE230

230 CLS:ONL GOTO232,234,236,238,

232 PRINTBA\$" :"A\$(RN):PRINT:LIN EINPUT"CHANGE TO: ";A\$(RN):GOTO2

234 PRINTBB\$" :"B\$(RN):PRINT:LIN EINPUT"CHANGE TO: ";B\$(RN):GOTO2

236 PRINTBC\$" :"C\$(RN):PRINT:LIN EINPUT"CHANGE TO: ";C\$(RN):GOTO2

238 PRINTBD\$" :"D\$(RN):PRINT:LIN EINPUT"CHANGE TO: ";D\$(RN):GOTO2

240 PRINTBES" : "E\$(RN):PRINT:LIN EINPUT"CHANGE TO: ";E\$(RN):GOTO2 42

242 CLS:GOSUB574

244 PRINT"IS THIS CORRECT (y/n)

246 L\$=INKEY\$: IFL\$=""THEN 246

248 IFL\$="y"ORL\$="r"ORL\$="Y"ORL\$ ="R"THEN56

250 IFL\$="n"ORL\$="N"THENCLS:GOTO

222 252 GOTO246

254 REM SEARCH ROUTINE

256 CLSO: PRINT@128, S\$: PRINTU\$

258 PRINT" 1> SEARCH BY "BA\$

260 PRINT" 2> SEARCH BY "BB\$
262 PRINT" 3> SEARCH BY "BC\$

```
264 PRINT"
              4> SEARCH BY "BD$
266 PRINT"
              R> RETURN TO MENU
268 PRINTU$:PRINTS$:SOUND220,1
270 L$=INKEY$:IFL$=""THEN270
272 IFL$="r"ORL$="R"THEN56
274 L=VAL(L$)
276 IFL<lorL>4THEN270ELSE278
278 CLS:ONL GOTO280,316,352,388
280 REM SEARCH
282 CLS:PRINTS$
284 PRINT"
                SEARCH FOR "BA$
286 PRINTS$
288 PRINT"ENTER "BA$" FOR SEARCH
":LINEINPUTSR$
290 M=0:N=0:FORRN=N TOREC:IFSR$=
A$(RN)THEN292ELSE294
292 M=M+1
294 NEXTRN
296 CLS1:FORRN=N TOREC:PRINT@32,
         SEARCH FUCTION"
298 IFSR$=A$(RN)THENGOSUB574ELSE
312
300 PRINT"THERE IS/ARE "M" FILE/
S MEETING YOUR SPECIFICATIONS.
IS THIS
          THE ONE YOU WANT <y/n>
3 "
302 L$=INKEY$:IFL$=""THEN302
304 IFL$="n"ORL$="N"THEN312
306 IFL$="r"ORL$="R"THEN56
308 IFL$="y"ORL$="Y"GOSUB652
310 GOTO302
312 NEXTRN
314 CLS:PRINT@201, "FILE NOT FOUN
D":FORX=1T0300:NEXTX:GOT056
316 REM SEARCH
318 CLS:PRINTS$
320 PRINT"
                SEARCH FOR "BB$
322 PRINTS$
324 PRINT"ENTER "BB$" FOR SEARCH
":LINEINPUTSR$
326 M=0:N=0:FORRN=N TOREC:IFSR$=
B$(RN)THEN328ELSE330
328 M=M+1
330 NEXTRN
332 CLS1: FORRN=N TOREC: PRINT@32,
         SEARCH FUNCTION"
334 IFSR$=B$(RN)THENGOSUB574ELSE
348
336 PRINT"THERE IS/ARE "M" FILE/
S MEETING YOUR SPECIFICATIONS.
S THIS THEONE YOU WANT <y/n>?"
338 L$=INKEY$:IFL$=""THEN338
340 IFL$="n"ORL$="N"THEN348
342 IFL$="y"ORL$="Y"GOSUB652
344 IFL$="r"ORL$="R"THEN56
```

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346 GOTO338

348 NEXTRN

350 CLS:PRINT@201,"FILE NOT FOUN

D":FORX=1T0500:NEXTX:GOT056

352 REM SEARCH

354 CLS: PRINTS\$

356 PRINT" SEARCH FOR "BC\$

358 PRINTS\$

360 PRINT"ENTER "BC\$" FOR SEARCH

":LINEINPUTSR\$

362 M=0:N=0:FORRN=N TOREC:IFSR\$=

C\$(RN)THEN364ELSE366

364 M=M+1

366 NEXTRN:CLS1:FORRN=N TOREC

368 PRINT@32,"

SEARCH FU

NCTION"

370 IFSR\$=C\$(RN)THENGOSUB574ELSE

384

372 PRINT"THERE IS/ARE "M" FILE/

S MEETING YOUR SPECIFICATIONS.

S THIS THEONE YOU WANT <y/n)?"

374 L\$=INKEY\$:IFL\$=""THEN374

376 IFL\$="n"ORL\$="N"THEN384

378 IFL\$="r"ORL\$="R"THEN56

380 IFL\$="y"ORL\$="Y"GOSUB652

382 GOTO374

384 NEXTRN

386 CLS:PRINT@201, "FILE NOT FOUN

D":FORX=1T0500:NEXTX:GOT056

388 REM SEARCH

390 CLS:PRINTS\$

392 PRINT" SEARCH FOR "BD\$

394 PRINTS\$

396 PRINT"ENTER "BD\$" FOR SEARCH

":LINEINPUTSR\$

398 M=0:N=0:FORRN=N TOREC:IFSR\$=

D\$(RN)THEN400ELSE402

400 M=M+1

402 NEXTRN

404 CLS: FORRN=N TOREC: PRINT@32,"

SEARCH FUNCTION"

406 IFSR\$=D\$(RN)THENGOSUB574ELSE

420

408 PRINT"THERE IS/ARE "M" FILE/

S MEETING YOUR SPECIFICATIONS. I

S THIS THEONE YOU WANT <y/n>?"

410 L\$=INKEY\$:IFL\$=""THEN 410

412 IFL\$="n"ORL\$="N"THEN 420

414 IFL\$="r"ORL\$="R"THEN56

416 IFL\$="Y"ORL\$="y"GOSUB652

418 GOTO 410

420 NEXTRN

422 CLS:PRINT@201,"FILE NOT FOUN

```
D":FORX=1T0500:NEXTX:GOT056
424 CLS(4):PRINT@160,S$:PRINTUS
426 PRINT"
                 1> SORT BY "BA$
428 PRINT"
                 2> SORT BY "BB$
430 PRINT"
                 3> SORT BY "BC$
432 PRINT"
                 R> RETURN TO MAI
N MENU"
434 PRINTUS: PRINTS$
436 SOUND 220,1
438 L$=INKEY$:IFL$=""THEN 438
440 IFL$="r"ORL$="R"THEN56
442 L=VAL(L$)
444 IFL>OANDL<4THEN446ELSE438
446 CLS: ONL GOTO 448, 472, 494
448 REM SORT
450 CLS4: PRINT@192,"
SORTING": PRINT@352,"
                               DO
NOT DISTURB"
452 A2=REC
454 IFA2<=2THEN470
456 A3=0:FORA1=1TOA2-1
458 IFA$(A1) <= A$(A1+1) THEN 464
460 A3=A1+1
462 GOSUB610
464 NEXTAL
466 A2=A3:GOTO454
468 GOTO 454
470 GOTO56
472 REM SORT
474 CLS4: PRINT@192,"
SORTING": PRINT@352,"
                               DO
NOT DISTURB"
476 A2=REC
478 IFA2<=2THEN492
480 A3=0:FORAl=1TOA2-1
482 IFB$(A1) <= B$(A1+1) THEN 488
484 A3=A1+1
486 GOSUB610
488 NEXTAL
490 A2=A3:GOTO478
492 GOTO56
494 REM SORT
496 CLS(4):PRINT@192,"
  SORTING": PRINT@352,"
                                 D
O NOT DISTURB"
498 A2=REC
500 IFA2<=2THEN514
502 A3=0:FORA1=1TOA2-1
504 IFC$(Al) <= C$(Al+1) THEN 510
506 A3 = A1 + 1
508 GOSUB610
510 NEXTAL
512 A2=A3:GOTO500
```

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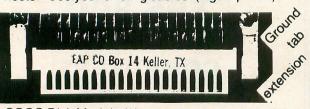
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514 GOTO56

516 CLS3:PRINT@192," INSERT DATA TAPE INTO RECORDER"

518 PRINT"

REWIND THE RECOR

DER"

520 PRINT"

PRESS PLAY AND RE

CORD"

522 INPUT"NAME OF THIS FILE"; DA\$

: PRINT: PRINT

524 L=LEN(DA\$)/2:C=207-L

526 CLS:PRINT@140, "SAVING"

528 PRINT@C, DA\$: PRINT@266, "DATA FILE"

530 OPEN"O",#-1,DA\$

532 PRINT#-1,BA\$,BB\$,BC\$,BD\$,BE\$

534 FORX=1TO150: IFA\$(X)=""THEN54

536 PRINT#-1,A\$(X),B\$(X),C\$(X),D

\$(X),E\$(X)

538 NEXTX

540 CLOSE#-1:GOTO56

542 CLS3:PRINT@192," INSERT DATA

TAPE INTO RECORDER"

544 PRINT" REWIND THE RECOR DER"

546 PRINT" PRESS PLAY" 548 INPUT"ENTER FILE NAME:";DA\$

550 IFDA\$="r"ORDA\$="R"THEN56ELSE

552

552 L=LEN(DA\$)/2:C=207-L

554 CLS:PRINT@139,"LOADING"

556 PRINT@C, DA\$

558 PRINT@266, "DATA FILE"

560 OPEN"I", #-1, DA\$

562 INPUT#-1,BA\$,BB\$,BC\$,BD\$,BE\$

564 FORX=1T0150

566 IFEOF(-1)THEN572

568 INPUT#-1,A\$(X),B\$(X),C\$(X),D

\$(X),E\$(X)

570 NEXTX

572 CLOSE#-1:REC=X-1:GOTO56

574 PRINT" 1: "A\$(RN)

576 PRINT" 2: "B\$(RN)

578 PRINT" 3: "C\$(RN)

580 PRINT" 4: "D\$(RN)

5: "E\$(RN) 582 PRINT"

584 PRINT" THIS IS RECORD # "; RN: PRINT "PRESS <R> TO RETURN TO

MAIN MENU

586 RETURN

588 REM PRINT ROUTINE

590 PS=PEEK(65314):IFPS=4ORPS=6T

HEN 594 ELSE 592

592 CLS:PRINT@160, "PRINTER NOT O N-LINE":PRINT:PRINT:P	
RINT:LINEINPUT"PRESS ENTER WHEN	
ON-LINE."; X\$:GOTO590	
594 CLS:L=LEN(DA\$)/2:C=40-L	
596 PRINT#-2, TAB(C)DA\$:PRINT#-2,	
TAB(3)R\$	
598 PRINT#-2, TAB(4)BA\$TAB(20)BB\$	
TAB(36)BC\$TAB(52)BD\$TAB(68)BE\$	
600 PRINT#-2, TAB(3)STRING\$(80,"-	
")	
602 FORX=lTOREC	
604 PRINT#-2, TAB(1)A\$(X)TAB(16)B	
\$(X)TAB(32)C\$(X)TAB(48)D\$(X)TAB(
64)E\$(X)	
606 NEXTX 608 CLS:GOTO56	
610 REMSORT ROUTINE	
612 T(1)=A$(A1):T$(2)=B$(A1):T$$	
(3)=C(A1):T(4)=D(A1):T(5)=E	
(Al)	
614 A(A1) = A(A3) : B(A1) = B(A3) :	
C\$(A1)=C\$(A3):D\$(A1)=D\$(A3):E\$(A	
1)=E\$(A3)	
616 A(A3)=T$(1):B$(A3)=T$(2):C$$	
(A3)=T\$(3):D\$(A3)=T\$(4):E\$(A3)=T	
\$(5)	
618 RETURN	
620 REM VIEW ROUTINE	
622 CLS:FORX=lTOREC:PRINT:PRINT 624 CLS:PRINT@32," THIS IS	
624 CLS:PRINT@32," THIS IS FILE#"X	
626 PRINTBA\$" :"A\$(X)	
628 PRINTBB\$" :"B\$(X)	
630 PRINTBC\$" :"C\$(X)	
632 PRINTBD\$" :"D\$(X)	
634 PRINTBE\$" :"E\$(X)	
636 PRINT:PRINT:PRINTS\$:PRINT"	
PRESS (N) FOR NEXT FILE":PRINT	
" PRESS (R) FOR RETURN TO MENU":	
PRINT" PRESS (L) FOR PRECEDING F	
ILE": PRINTS\$	
638 L\$=INKEY\$:IFL\$=""THEN638 640 IFL\$="n"ORL\$="N"THEN646	
642 IFL\$="r"ORL\$="R"THEN56	
644 IFL\$="1"ORL\$="L"THENX=X-1:SO	
UND220,1:IFX=OTHEN648ELSE624	
646 CLS:SOUND220,1:NEXTX	
648 CLS:FORX=1T0150:PRINT@256,"	
FILES COMPLETED": NEXTX	
650 GOTO56	
652 PRINT"GLAD I COULD HELP! PR	
ESS <r> TO RETURN TO THE MAIN ME</r>	
NU": RETURN	
654 PCLEAR1:GOTO16	

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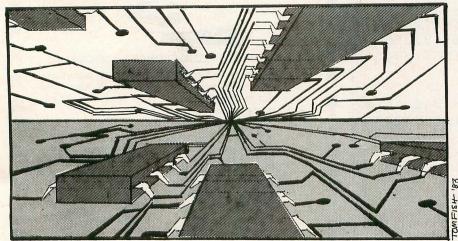
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Stepper

Step through programs as slowly as you like.



by Dave Jenkins



16K Extended Color Basic

XTENDED COLOR Basic includes a very helpful debugging routine that prints each line number of a Basic program to the screen as it is executed. The user can then spot the troublesome lines.

However, this routine runs very quickly, making it difficult to determine which line is the troublemaker. By the time I spotted a bug the program had executed another 10 lines. Also, the tracer printed the line number wherever the next print location happened to be, destroying any special layouts or graphics on the text screen. I wanted to modify Basic to step through the program a line at a time and wait for the user to press a key to continue. The program would then report the number of the next line to be executed.

Microsoft placed branches from the ROM to the RAM in vital areas. Under Basic, these RAM locations cause the program to jump back to the ROM from whence it came. Extended and Disk Basic place new instructions in these RAM locations to jump to routines in the new ROM. Program execution is along the lines of old ROM — RAM — new ROM — old ROM.

Changing Basic

When the computer receives the TRON command it stores a value at \$AF.

While a program is running, Basic checks this flag. If the tracer is on, it prints a left bracket, line number and right bracket. If the tracer is off, it skips this routine.

If the tracer is on, the Stepper intercepts Basic as it is about to print the left bracket. (Actually, Basic goes to this routine before printing anything.) If a left bracket is to be printed the routine sends a new print position to Basic. The left bracket and line number are then printed. The line number printed will be the next line to be executed. When the Stepper intercepts a right bracket, the end of the trace, the bracket is printed. The Stepper then restores the old print position and waits until a key is pressed. If the tracer is off no action is taken. Since the Stepper only works with the tracer on, the TRON and TROFF commands control the Stepper.

Look at the Program Listing: first, the Stepper looks at the tracer flag. If it is off (set to zero), the Stepper immediately returns to Basic. Otherwise the Stepper looks for a left bracket. The left bracket is value \$5B, printed from the A register. If A is not \$5B the Stepper looks for a right bracket.

When the Stepper finds a left bracket it follows several steps. Since we will use the X register we'll save the current contents on the hardware stack. Next, the old print position is fetched from RAM address \$88 and stored in high RAM.

Then the new print address is placed at \$88. The old X register is pulled off the stack and the program returns to Basic.

Basic prints the line number, then gets ready to print a right bracket. Again the Stepper intervenes; the Stepper prints the right bracket and restores the old print position.

A routine to check for a key pressed before going to the next Basic line worked very well, except for one side-effect: it disabled the Break key and INKEY\$ keyboard scans. The only way to stop program execution was by using the Reset button. Since Reset clears the text screen, any information on it was lost. I replaced the key-scanning routine with a simple delay loop. The Break key, INKEY\$ scans and Shift @ keys will work to halt execution. However, you must hold these keys down long enough for the Stepper to return to Basic where they will be recognized. Listings requiring use of the Reset button, and Listings with the delay loop, are included with this article.

When the Stepper returns to Basic, Basic will still attempt to print a character. Register A is loaded with \$1E, which does not print to the screen. After either the keyboard scan or delay loop, the old X register is retrieved and control returns to Basic.

The Basic programs are simply loaders for the machine code. Either version requires only 56 bytes. Since the tracer is only an Extended or Disk Basic function, the Stepper will not work on regular Basic

What It Isn't

You cannot use the Stepper and watch hi-res graphics at the same time. The computer automatically switches to the text screen whenever it prints on the

Since the Stepper looks for left and right brackets for operation, any program which prints these characters will be affected. The program will not crash, but the Stepper will assume a trace is coming and change the printing position. I have not yet found a program that used these characters. Any that do could be changed to parentheses, or you could use the unmodified tracer.

These limitations apply only when the tracer is on. When the tracer is off, Basic skips the Stepper altogether.

An important note — save the Basic program to disk or tape before running it. If you want a machine language file of the program on tape, type: CSAVEM "STEP PER", &H3FC7, &H3FFD, &H3FC7. Before CLOADing, reserve high RAM with: CLEAR 200, 16326. CLOADM the Stepper. Then: POKE 360, 63: POKE 361, 199.

THE COLOR BASINE

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Program Listing. Stepper with pause until keystrike (requires Reset to stop Basic).

3FC7			00200		ORG	\$3FC7
3FC7	7D	00AF	00210	START	TST	>\$AF
3FCA	27	2 F	00220		BEQ	RETURN
3 FCC	81	5B	00230		CMPA	#\$5B
3FCE	26	12	00240		BNE	NEXT
3FD0	34	10	00250		PSHS	X
3FD2	BE	0088	00260		LDX	>\$88
3FD5	BF	3FFE	00270		STX	\$3FFE
3FD8	8E	05F9	00280		LDX	#\$5F9
3 FDB	BF	8800	00290		STX	>\$88
3 FDE	35	10	00300		PULS	X
3FEO	20	19	00310		BRA	RETURN
3FE2	81	5 D	00320	NEXT	CMPA	#\$5D
3FE4	26	15	00330		BNE	RETURN
3FE6	BD	A285	00340		JSR	\$A285
3FE9	34	10	00350		PSHS	X
3 FEB	BE	3FFE	00360		LDX	\$3FFE
3 FEE	BF	8800	00370		STX	>\$88
3FF1	AD	9F A000	00380	KEY	JSR	[\$A000]
3FF5	27	FA	00390		BEQ	KEY
3FF7	86	1E	00400		LDA	#\$1E
3FF9	35	10	00410		PULS	X
3FFB	7E	8273	00420	RETURN	JMP	\$8273
		3FC7	00430		END	START

00000 TOTAL ERRORS

KEY 3FF1 3FE2 NEXT RETURN 3FFB START 3FC7

Program Listing. Basic Loader for Stepper with pause.

90 CLEAR 200, 16326 100 FOR X= 16327 TO 16381 110 READ Y : A = A + Y : POKE X, Y: NEXT 120 IF A < > 5465 THEN PRINT "ER ROR!!! RECHECK YOUR DATA!!" : LI ST 150 -130 POKE 360,63 : POKE 361,199 140 CLS : PRINT : PRINT " THE ST EPPER IS READY." : PRINT " TO AC TIVATE, TYPE 'TRON'." : PRINT TO DEACTIVATE, TYPE 'TROFF'." 200 DATA 125,0,175,39,47,129,91 210 DATA 38,18,52,16,190,0,136 220 DATA 191,63,254,142,5,249 230 DATA 191,0,136,53,16,32,25 240 DATA 129,93,38,21,189,162 250 DATA 133,52,16,190,63,254 DATA 191,0,136,173,159,160 260 270 DATA 0,39,250,134,30,53,16

280 DATA 126,130,115

Program Listing. Stepper with delay (Break will stop Basic). 00200 ORG \$3FC7 3FC7 3FC7 7D 00 AF 00210 START TST >\$AF 3FCA 27 2F 00220 BEO RETURN 00230 #\$5B 3FCC 81 5 B CMPA 12 00240 BNE NEXT 3FCE 26 10 00250 PSHS 3FD0 34 X >\$88 3FD2 BE 0088 00260 LDX 3FD5 BF 3FFE 00270 STX \$3FFE #\$5F9 05F9 00280 LDX 3FD8 8E 3FDB BF 0088 00290 STX >\$88 3 FDE 35 10 00300 PULS X 3FEO 20 19 00310 BRA RETURN 5D 00320 NEXT #\$5D 3FE2 81 CMPA BNE 15 00330 RETURN 26 3FE4 A285 00340 \$A285 3FE6 BD JSR 3FE9 86 1E 00350 LDA #\$1E 3 FEB 34 10 00360 **PSHS** X 00370 \$3FFE 3 FED BE 3FFE LDX 00380 >\$88 3FF0 BF 0088 STX 3FF3 8E F000 00390 LDX #\$F000 3FF6 BD A7D3 00400 DELAY JSR \$A7D3 3FF9 35 10 00410 PULS X 00420 RETURN JMP \$8273 3FFB 7E 8273 3FC7 00430 END START 00000 TOTAL ERRORS 3FF6 DELAY 3FE2 NEXT 3FFB

Program Listing. Basic Loader for Stepper with delay.

RETURN START

3FC7

90 CLEAR 200, 16326 100 FOR X= 16327 TO 16381 110 READ Y : A = A + Y : POKE X, Y: NEXT 120 IF A < > 5633 THEN CLS : PRI "ERROR!!! RECHECK YOUR DATA! : LIST 150 130 POKE 360,63 : POKE 361,199 140 CLS: PRINT: PRINT " THE ST EPPER IS READY." : PRINT " TO AC TIVATE, TYPE 'TRON'." : PRINT TO DEACTIVATE, TYPE 'TROFF'." 200 DATA 125,0,175,39,47,129,91 210 DATA 38,18,52,16,190,0,136 220 DATA 191,63,254,142,5,249 230 DATA 191,0,136,53,16,32,25 240 DATA 129,93,38,21,189,162 250 DATA 133,134,30,52,16,190 260 DATA 63,254,191,0,136,142 270 DATA 240,0,189,167,211,53 280 DATA 16,126,130,115



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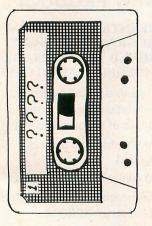
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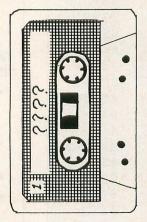


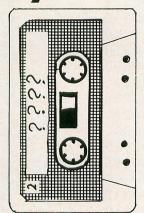
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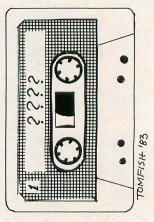
VISA'

Directory:XXX









Never wonder what's on a cassette again.

OW MANY TIMES have you worked long into the night on a special program, and then returned days later only to discover that you can't remember where you saved it to last? Or, maybe you just found a tape and can't recall what was written on it. The CASSDIR program will solve these problems. If you have a printer it will provide a directory listing that you can store away with the tape. It also gives you more information than using the old standby SKIPF "X".

To run CASSDIR, load the program, place a cassette in your recorder, rewind and set to play. Then type RUN. The program asks only one question: SCREEN (0) OR PRINTER (1). Enter 0 or 1, any other answer is wrong. Your directory listing will slowly appear on the screen or the printer.

CASSDIR gives you not only the name, but the file type. I use file type 4 to indicate files written by my editor, which may not be correct for you (since you are probably not using my editor). CASSDIR then tells you whether the file is ASCII (human readable) or binary (machine readable), and whether the file has gaps between each block. Most Basic files saved (those not saved using CSAVE "XXX". A) will have no gaps.

The final tidbit of information printed is the number of blocks of data in the file. Using only Basic with EXEC commands does not allow block counting in files that have no gaps. Files without gaps have this number set to -1. Figure 1 is an example of a directory.

To stop the program press any key and the program will stop at the end of the

by Byron Palmer

file it's on. If there are no more files on the tape you will have to push the Reset button to stop the program. This is like the SKIPF "X" technique.

There are two interesting EXEC commands to call ROM routines. The first reads in a tape block and is located at \$A701 (42753). Data read by this call is stored starting at \$1DA (474) and is discovered using PEEKs. The second ROM call is to the SKIPF routine, to skip the rest of a continuous file. This routine starts at address \$A6D1 (42705). If a tape error

exists, the program does not stop. If the program finds a block of data which is not a file name block, when it expects one, or if there is some sort of error in the tape, then it lists the file as an Error and continues. SKIPF "X" cannot function this way.

If, like me, you can never accept a program from someone else without improving it, here are some natural extensions that will provide a programming challenge. You could print the beginning, ending, and starting points for CLOADM type files. You could PEEK around in the ROM and learn enough to write an assembly language routine to get the number of blocks from a continuous file. But even if you don't accept the challenge, you will still find this program useful.

Fic	ure	1 P	Oar	am l	Out	nut
1 1)=	uic	1.11	UBI	arri	Juy	Jul

PLANCOV BASIC BINARY CONT-1 LEAKYTAP BASIC BINARY CONT-1 HOUSEADV BASIC BINARY CONT-1 HOUSEADV BASIC ASCII GAPS 12 KEEPTEXT BASIC BINARY CONT-1 KEEPTEXT BASIC ASCII GAPS 22 INST1 DATA ASCII GAPS 17 INST2 DATA ASCII GAPS 18 ROWBOAT BINAR BINARY CONT-1 LISTMOD BINAR BINARY CONT-1	FILE	TYPE	STRU	GAPS #
LISTMOD BINAR BINARY CONT-1	PLANCOV LEAKYTAP HOUSEADV HOUSEADV KEEPTEXT KEEPTEXT INST1	BASIC BASIC BASIC BASIC BASIC BASIC	BINARY BINARY BINARY ASCII BINARY ASCII ASCII	CONT-1 CONT-1 CONT-1 GAPS 12 CONT-1 GAPS 22 GAPS 17
	ROWBOAT	BINAR	BINARY	The second secon

Program Listing. CASSDIR

110gram Listing, CASSDIK
60 REM LOAD TAPE, SELECT DEVICE
70 REM HIT ANY KEY TO STOP DIR
80 REM HIT RESET IF NECESSARY
90 REM #=NUMBER OF DATA BLOCKS
100 REM # IS NOT VALID FOR CONT
110 REM (NO GAP) FILES
120 REM
130 INPUT "SCREEN(0) OR PRINTER
(1)"; DN: DN=-2*DN
140 PRINT#DN:PRINT#DN:PRINT#DN,"
FILE TYPE STRU GAPS #"
150 PRINT #DN,"
160 POKE 126,1:POKE 127,218' SET
UP READ BUFFER
170 EXEC 42753' READ IN BLOCK(\$A
701)
180 A=PEEK(124):IF A=255 THEN 38
0' CHECK EOF
190 IF A<>0 AND N=0 THENPRINT#DN
,"ERROR";
200 IF A<>0 THEN N=N+1:GOTO 170
210 IF N<>0 THEN PRINT #DN,N
220 N=1
230 REM PRINT OUT FILENAME
240 FOR I=474 TO 481:PRINT #DN,C
HR\$(PEEK(I));:NEXT I
250 FT=PEEK(482)' FILE TYPE
260 PRINT #DN," ";
270 IF FT=0 THEN PRINT #DN, "BASI
C";
280 IF FT=1 THEN PRINT #DN, "DATA
";
290 IF FT=2 THEN PRINT #DN, "BINA
R";
300 IF FT=3 THEN PRINT #DN, "ASSE
M";
310 IF FT=4 THEN PRINT #DN, "EDIT
";
320 IF FT>4 THEN PRINT #DN, "UNKW
N";
330 IF PEEK(483)<>0 THEN PRINT #
DN," ASCII "; ELSE PRINT #DN," BI
NARY";
340 GA=PEEK(484)' GAP FLAG
350 IF GA=255 THEN PRINT #DN," G
APS"; ELSE PRINT #DN," CONT";
360 IF GA<>255 THEN 420
370 GOTO 170
380 PRINT #DN,N:N=0' END OF FILE
390 IF INKEY\$<>"" THEN PRINT #DN
:STOP 400 GOTO 170
410 REM SKIPF FOR CONT FILE 420 EXEC 42705:N=-1:GOTO 380

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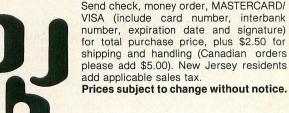
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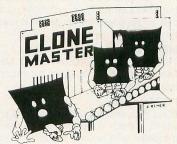
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Erland

The most complex simulation we have ever seen, and you VIKING! fans will want to take note. This game has you running a small holding.

a small holding in old Ireland. You must manage your land, sheep, army, markets, fishing fleets, taxes, and many other factors while you try to rise in rank to become King or Queen. You may attack - or be attacked - by the other players, and you will have to face the fact that there isn't enough land to go around, and you may have to take some away from someone else! This 32K game is considerably more complex and difficult than our super popular VIKING! Because of this, we have added a savethe-game feature. ERLAND is for 2 to 5 game lovers, and will warm the heart of anyone who liked VIKING!, Monopoly, or other classic strategy games. This game is a hybrid of Extended Basic and Machine language. The disk and tape versions are not interchangable. Tape - \$24.95; Disk -\$29.95



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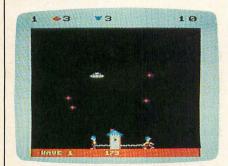
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--- REVIEW\$

Outhouse

by J. Weaver, Jr. distributed by Computer Shack W H Enterprises 859 Winston Monroe, MI 48161 **\$29.95 disk, \$27.95 cassette**



EVERY PROGRAM TELLS YOU it is original, unique, completely different, and so on. I found one that truly is.

Outhouse is as strange a concept as can be imagined. You hover above your outhouse trying to zap the thief and the squatter who are trying as hard as they can to steal your toilet paper from the outhouse. Not only do you have to watch out for the paper thieves, but there are some other nasties flying through the air that can take a toll on your ship and the outhouse.

The first thing I noticed about this game was the work put into the graphics: very clean and smooth movement on the part of the ships, flying nasties, and the two strolling paper stealers. The colors are good, with a black night sky for a background, and a very convincing outhouse with obligatory crescent moon on the door. Even the graphics used to portray the door opening and closing are good. This is one of the better examples of machine language programming and graphics I have seen. The author also did a fine job depicting the paper being strung out of the shack and ferreted away by the thief.

The introduction on the screen is clear and concise. It shows the kind of enemy objects to watch out for plus gives an introduction to the antics of the paper pinchers. A beginner to computers and games will have no trouble figuring this one out.

One of the intriguing things about the game is the way one shoots at the bad guys. (Actually, the game is so bizarre, it's hard to call them the bad guys.) The way it shoots depends on the direction you have your ship going. If you are

heading straight down and fire, the bolt will, accordingly, go straight down. If you are heading obliquely and fire, the shot will head in that direction. The joystick control is very smooth, making for an enjoyable game. I didn't use the keyboard control at all.

As I got better at the game, I noticed interesting things happening. After I got through three waves of the enemy, I had to be careful not to let some of the flying obstructions sit on top of the outhouse, for they have a lousy habit of crushing the thing. There are other flying weirdies that do damage to the shack also. Big, blocky things flatten the outhouse quite easily. However, if you knock them out, they are worth many points. You are also given three smart bombs that wipe out an entire screen of baddies. Use one if you are getting flustered. You get more when you go through each wave of attackers, and your ship supply is replenished (if you have lost any). At the beginning you are given three ships, three bombs, and 200 feet of toilet paper.

This game is quite a gem. The graphics are very good, the action is fast and clean, and the concept is delightfully silly. I recommend the game for anyone, regardless of age.

- Leslie Venable

Hyperzone

by Mike Lustig Computerware Box 668 Encinitas, CA 92024 (619)436-3512 \$26.95 cassette, \$29.95 disk



To START, THE PERSPECTIVE used in "Hyperzone" is a great idea for the Color Computer. There you sit, looking out into the great void, while enemy ships come at you, firing bombs. You are looking out of the cockpit, and as you fire, your shots go forth like the head-

lights on your car. By using your joystick you can maneuver up and down and left and right to avoid bombs and to get the enemy ships in sight. The object is to get the enemy directly in front of you, but not too close. Fire away with the button and hope for the best.

Looking out into space is wonderful. The illusion of maneuvering is great fun. Watching the stars go by in proportion to

your steering is also nifty.

However, 'though the game is innovative for the Color Computer, it needs some work. The motion of the space ships and bombs is jerky and slow, and steering is uncertain, slow, and not sweeping enough. Many times your ship is blasted by a bomb that can't be seen. As you go along, merrily plastering the enemy, all of a sudden the background and foreground colors change. This is very unnerving because the color combinations can make it hard to see clearly. The bombs are hard to distinguish, and the image becomes reversed and difficult to follow.

The game has a shield feature that protects your ship from bombs. The shields take up a lot of energy, so don't use them all the time. The only way to replenish your energy is to hit spinning energy pods. Unfortunately, the energy pods appear only at random intervals and it is hard to tell if you have hit them. Also, when the shields are up the screen shows a grid of shields right in front of your cockpit, making it difficult to see what is going on. Perhaps an indicator at the bottom of the screen would be easier to work with. I don't know if it was the keyboard of the Color Computer I was using, but many times I got no response when hitting random keys to turn the shields on and off.

"Hyperzone" has ten levels of play. The difference is in the number of ships you get and the number of the enemy engaged. It would be nice to have a speed setting that controls the speed of the enemy and the speed of your ship.

All in all, the game is a step in a fantastic direction, but it could use some work. The directions are quite adequate, so beginners will have no trouble figuring out how to play. The opening graphics are very nice, indeed. The only problem is that you have to sit through them each time a game ends. Perhaps a menu could be added to put you back into the game if desired.

With some refinements in the machine language motion routines, this game could rival some of the best perspective

- REVIEW\$

space games ever produced. It's a good game for children and adults.

— Mary Chaucer Computerware says that the screen color changes indicate time zone changes, and that the other bugs mentioned by our reviewer have been worked into the game on purpose to increase its overall difficulty.

Gin Champion

By Philidor Software Licensed to Tandy Corporation One Tandy Center Fort Worth, TX 76102 \$29.95 RomPak



BEWARE, ... YOU COULD FIND yourself shouting wildly at the computer!" That warning is on the first page of the instruction manual of "Gin Champion," and for good reason, as those of you who accept the challenge will discover

There are five versions of gin and 10 skill levels. The game begins at level one with standard gin. You are given the opportunity to change levels and to choose which version you want to play before starting the game. Other versions of the game are "Oklahoma," "Runs Around the Corner," "Spades Double," and "Laying Off on Gin." You can play one or any combination.

A previous knowledge of gin is not required to enjoy "Gin Champion," for the manual is very thorough and the computer will not let rules be broken. For example, if you "knock" with too many points in your hand the computer immediately responds with an ILLEGAL KNOCK message. You then can review your hand (without penalty) before going on with the game.

The lower levels will challenge the novice just as the upper levels challenge

the more knowledgeable player. All levels are capable of winning, thereby causing you to "Shout Wildly!"; however, don't give up because the next hand may find you shouting "GOTCHA!!"

"Gin Champion" is a ROM cartridge and requires 16K but not Extended Basic. Try it, you'll like it.

— by Dale M. Harris

Celestial Basic

by Eric Burgess Sybex 2344 Sixth Street Berkeley, CA 94710 \$13.95

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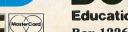
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Educational Systems, Inc. Box 1226, Norman, OK 73070 One look through Eric Burgess' book Celestial Basic reveals how primitive our methods were. Celestial Basic is an excellent text for someone who has graduated beyond binoculars and toy store telescopes. The text mainly consists of Basic programs that determine and/or locate the exact time and position of stars and planets. Because most of the programs are strictly calculations, they should run on almost any microcomputer that has enough memory.

The book also contains a few graphic programs. The author mentions these programs were written on an Apple II (tm) computer using Applesoft (tm) Basic. One exception is a graphic program written in the Exidy Sorcerer (tm) computer's Basic format. The author believes these programs can be easily modified to run on other microcomputers. I did not type in any of the programs to try the conversion, so I have no estimate of the effort that would be required to convert for the Color Computer.

Celestial Basic is a specimen publication. Non-reflecting slick paper provides a suitable background for the clean, crisp text printed on it. Each program has a photograph of the celestial body for

which it is programmed, a clearly written text of the program, and a photo of the program data as it will be displayed on TV or monitor screens. These photos show the program data displayed on a 40 character by 24 line screen. Since the Color Computer has a 32 character by 16 line screen, some modifications will be necessary.

Near the end of the book are two pages of text I thought should have been at the front of the book. Here are found seventeen statements called an "Observer's Guide to the Programs." These statements are masterpieces of brevity; they clearly tell the name of the program, what it does and why one would want to use it.

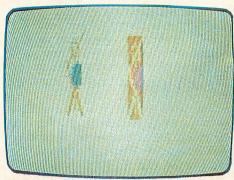
It seemed to me that there was one serious omission. The author should have listed the Basic statements used in his programs, so those of us with more modern computers could determine at the onset what changes will have to be made in the listings before we have typed in half the program.

The author states that results obtained by the computations are sufficiently accurate for most practical purposes. A bibliography is included for those needing more precise computations. Celestial Basic would be an excellent addition to the library of any astronomer who uses a computer or any computerist who uses a telescope.

— by Russel M. Hokanson

Wizard 64

by Chris Hawks Skyline Marketing Corp. 4510 W. Irving Park Rd. Chicago, IL 60641 \$21.95 cassette, \$23.95 disk



F YOU LIKE Lord of the Rings-type imagery, working out mazes, and

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TRS-80 Color Computer Program Writing Workbook, by Ron Clark, **96** pages, 8 1/2×11, ISBN 0-86668-816-1. **\$4.95**

searching for treasure, the Wizard's Tomb series is for you. But if you'd rather wield your own sword than watch a computer fight for you, you'll have to look elsewhere.

"Wizard 64" comes on cassette and disk and combines the previously released "Wizard's Tomb" parts one and two, each available only on cassette. While it does require Extended Basic, the game does not require a 64K machine as advertised — Skyline just has its own way of defining things. Part one leaves players deep in some catacombs that are themselves far above the buried treasure. Part two can be used either to pick up from there, or as a game in itself. The "64K" version offers the whole game at a substantial savings over the two part's combined cost. The tomb series can be played by one, two, three, or four play-

The game pits players against invisible greels, warogs, mummies, and the like, all loyal to the wizard. When the time for defensive action arrives, you simply enter either a Fight command or a command to cast a spell over your attacker, sit back, and watch some colorful, but so-so, graphics. Fights are short dances to the death between a pair of stiff, jumpy antagonists. The sword held by the figure representing you never moves, even when you win. Spells are Etch-A-Sketch kinds of graphics that grow on the screen to the accompaniment of sound effects. After either of these commands are executed the computer tells you to try one of them again, congratulates you on a victory, or tells you that you've lost. Skill as a joystick operator is the last thing you need. A little influence with the random number generator would be much hand-

Speaking of influence, you may have to buy your way into the tomb, so a small bag of gold is listed as one of the six "weapons" available at the inn, where play begins. Players may choose only three weapons. Besides the gold, weapons include food and water for a week, a chain of mace, a spell to repel attackers, a charm of protection, and a suit of armor complete with sword and shield. At the inn you're assigned a certain number of points; "life points" are used up during the game's general course, "ability" points are used during fights and spell-casting.

While there is little call for eye/hand coordination in this game, there is room for a different kind of cerebral excercise. There is a map display showing the inn, a lake, a forest, and a distant mountain

range that is the wizard's home, but you must plot your own course (with or without the help of a pencil and piece of paper) to keep track of your progress. Players move north, east, south, and west in one-step increments through the terrain and through the tomb itself. Keeping track of where you've been is always a good idea. It becomes more important in the tomb, as laced as it is with rooms, passageways, catacombs, and dangers.

The fun in "Wizard's Tomb" lies in unraveling the tomb's layout, avoiding the dangers within, battling the Middle Earth baddies, and, of course, reaching the payoff. It's a fine rainy afternoon's diversion for a group of kids, and for kids and their parents. It conjures up plenty of other-worldly spookiness and offers a good exercise in geographic orientation, but it is not an action game in the strict sense. Not-so-young players may be left with the odd feeling of having watched someone (or something) else fight their

— T.J., Color Staff

Pooyan

DataSoft Inc. 9421 Winnetka Ave. Chatsworth, CA 91311 (213)701-5161

\$29.95 cassette and disk



F YOU ARE a Color Computer arcade game fan and don't have a 32K computer, get an upgrade quickly. Once again DataSoft has introduced an arcade game for Color Computer users that needs 32K. The new game, "Pooyan," is plenty of fun and packs a lot of excitement.

Pooyan is a battle between pigs and wolves, and a mighty battle it is. While the nasty wolves float down from a treetop and throw deadly acorns at the pigs, the pigs defend themselves by shooting arrows at the wolves.

The pigs are somewhat defenseless

while being lowered from their cliff in a basket. The wolves use helium balloons to gently float down while throwing their acorns, so what can the poor pigs do? Use their one secret weapon — a chunk of meat. If a pig throws meat to the wolves, the wolves let go of their balloons and die. However, if too many wolves reach their lair, they can climb a ladder and attack from behind.

That is the challenge of the first scene: shoot 32 wolves in five rounds and you move to scene two. This is easier said than done and, per usual, the game gets tougher as you get better.

In scene two, balloons and wolves float from the bottom to the top of the screen, and some balloons have one or two additional balloons inside. You only make points when you hit the innermost balloon and the wolf falls to the ground.

In the second scene, when there are five or fewer wolves remaining, the Boss Wolf appears with a fancy, multicolored balloon. Don't be impressed by high-res graphics — hit him with the meat or with a barrage of arrows.

Don't let seven wolves get to the top in scene two, either. If you do, prepare for the ultimate disaster: a giant rock will

be pushed down on you.

Plenty of information is available on the screen. The number of wolves remaining is displayed at the top left, your remaining turns appear at top right. For entertainment, pigs that have been kidnapped are shown in jail at the lower left corner.

"Pooyan" is bound to be a big hit with Color Computer enthusiasts. It can be played with joysticks or the keyboard, it's a one or two player game, and a demonstration mode is included.

- by Paul Kimmelman

Dragon Cruncher

Elkan Electronics 1369 McCarter Highway Newark, NJ 07104

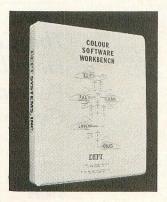
RUNCHER IS A MACHINE language program which can be loaded into either a Color Computer or a Dragon. It converts Basic programs for one into a program for the other.

Since I had just finished a review of the Dragon, I was anxious to review this first software arrival from the U.K. At first I thought the program would convert all Color Computer programs to run on the Dragon, but found it would only work on

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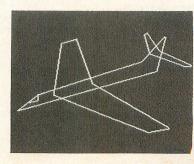
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- REVIEW\$

those written in Basic. This had not been a problem for me since, if I wanted to run a Color Computer program on the Dragon, I would save it to tape in ASCII and then CLOAD directly into the Dragon. This procedure would, of course, be impossible if the user did not have both computers available. This, then, is the reason for the existence of "Cruncher."

The program performs as advertised: CLOADM into either machine, then CLOAD the target Basic program. After the Basic program is loaded, type EXEC. You are given a choice of converting from TRS-80 to Dragon or vice-versa.

The program is simple, and it works. It would be helpful if you own one or the other computer, but not if you own both.

— Larry Cadman

The game is slow, but don't let that get in the way of having a good time. The game is a good time!

— C. DeSimone

The Complete Handbook of Personal Computer Communications

by Alfred Glossbrenner St. Martin's Press 175 Fifth Avenue New York, NY 10010 \$14.95

THIS BOOK'S TITLE indicates that it is a "complete handbook" and the subtitle states that the book tells you "eveything you need to know to go online with the world." Although these statements might appear to be hard to live up to, Mr. Glossbrenner's book comes very close to completely meeting the description.

The presentation can be divided into three primary areas: general information (the basics of communications); specific information (the many alternatives available); and appendices (useful information in concise form). In general, the book is written for the novice, assuming no previous knowledge or experience with computer communications. This approach is carried throughout, with very few lapses, and when specific terminology is used Mr. Glossbrenner includes appropriate definitions and examples. It is a technical book written for the nontechnical person.

In the general information category, the author presents numerous definitions and concepts. For example, he differentiates between information utilities, encyclopedic databases and bulletin board sytems, with appropriate definitions of each. He addresses the topic of telecommunication basics with a discussion of how databases are accessed, hardware and software concepts, including a section on troubleshooting.

The heart of the book, though, is the section on specific databases. Most of the chapters are dedicated to these discussions, and it is here that the book is most valuable. Mr. Glossbrenner gives on-line tips throughout and discusses the peculiarities of each database as only

Ms. Nibbler

by Thomas Czarnecki Color Quest 9072 Lyndale Ave. So., Minneapolis, MN 55420 (612)881-2777 \$19.95 cassette, \$24.95 disk

S. NIBBLER IS A POPULAR arcade simulation program that has enough sound and graphics to keep you playing for hours.

The scenario is a maze-like screen at the bottom of the ocean. The ovster at the top of the screen is you; in the box at mid-screen are three sandmonsters. You use the right joystick to guide your oyster through the maze while changing sandbits (red pixels) into pearls (blue pixels), trying all the while to avoid the sandmonsters. To get revenge on the sandmonsters you can eat one of the green catalyzers found in the corners of the screen. This will turn your character red; then you can eat steadily. Don't eat for too long, though; after you hear a clicking sound you will have just a little bit more time to eat the sandmonsters then trouble arrives.

Eating a green starfish, which will appear occasionally, scores points. Scoring is quite simple. You get 15 points each time you make a pearl, 30 points for eating a catalyzer, 500 points for eating a starfish. For eating the first monster you get 100 points, the second scores 200, the third 400, etc. The game also stores the 10 top high scores to compare yours against.

someone intimately familiar with each could. All of the most popular databases (The Source, CompuServe, The Dow Jones News/Retrieval Service and BBS's) are discussed (most have entire chapters dedicated exclusively to them). Additionally, much detailed information is presented on some of the lesser known databases such as DIALOG, BRS, ORBIT, The Information Bank, NewsNet, and others. After reading these chapters, one gets the impression that the next several months could be spent doing nothing but exploring the possibilities of all of these databases!

Some of the chapters are devoted to particular topics such as electronic commerce, conferencing via computer and telecommuting (linking up with other mainframes). Again, these chapters are well presented, contain a wealth of detail, and are accurate.

One of the strong points of the book is Mr. Glossbrenner's ability to present methods, tricks and time-saving tips rarely seen elsewhere, including documentaton from the databases themselves. Regarding CompuServe, for example, he suggests which documentation to purchase and which is better obtained on-line. He also enumerates some commands not documented anywhere on CompuServe but which are essential to moving about in the system with any facility.

The appendices are full of useful summaries such as tips on how to access typesetting, electronic mail, complete directories and quick references for the major information utilities (CompuServe and The Source). The tables and references in this section are very useful.

The book is full of sample on-line sessions and these help the reader develop a feel for what to expect while participating in computer communications. These sample sessions help the reader develop confidence before using the trial and error method, which often leads to frustration.

The book contains phone numbers of bulletin boards and other information access facilities. As time passes, this could be a negative point. As long as the book is current, that information is extremely useful; however, frequent revision will be the only way to keep this information updated.

That is true for the entire content of the book. The state of data communications is constantly changing; if Mr. Glossbrenner can continue to update the book for subsequent editions, it will continue to be a valuable reference.

This book is an excellent buy. At \$14.95 for 325 pages of valuable information, it is a must for anyone who seriously wants to enter the world of data communications. It handles a rather intimidating subject in a non-intimidating way. I highly recommend it.

— by Norman Garrett

A Mozart Composer

by A. Lee Messer, III Circle Soft 3325 Woodbine Lane Charlotte, NC 28210 \$14.95 cassette

OLFGANG AMADEUS MOZART (the inspiration for the Broadway play Amadeus) is credited with the composition of Musikalisches Wurfelspiel, although there is some question as to its authenticity. This quaint composition consists of two tables of measure numbers used with the toss of two dice, and a set of 176 numbered three-beat measures. The rows of each table correspond to the possible results of the toss of two dice (and are labled 2 through 12), while the columns are numbered with the Roman numerals I through VIII. There are 11 rows and eight columns per table, for a total of 88 measures per table, and 176 measures in all. The first table is used to generate the first eight measures of a minuet (complete with first and second endings) and the second table is used to generate the second eight-measure period of a minuet. To quote Carousel Publishing Corporation's edition of the Musikalisches Wurfelspiel, "The idea of such a game did not originate with Mozart, but his probably produces the most artistic results."

To use the Musikalisches Wurfelspiel in its original form is both time-consuming and awkward. You have to roll the dice for each measure, then find the number of the measure in the table of measure numbers, find the notes of the measure in the table of measures, and copy the notes of the measure onto blank manuscript paper. Finally, when you have done this 16 times, you are able to play the composition; you play the first eight measures with the first ending, repeat the first eight measures with the second ending, and finally play the second eight measures. This sequence (first

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eight twice with two endings, second eight measures) is then repeated once. Skill at sight reading helps.

There has to be a better way — and the Color Computer, with its excellent music playing ability, seems like the ideal device for removing the drudgery from the Musikalisches Wurfelspiel, since it cannot only pick the measures at random, but it can also play the composition for you.

There are three possible choices that could be used to play the composition: play only the melody line, using the Sound or Play commands in Basic; alternate rapidly between notes of the chords, using either the Sound or Play commands; or use machine language subroutines to play the notes of the chords simultaneously (such as is used in "The Composer," reviewed in the August issue of The Color Computer Magazine). The single-note approach is not very authentic, as sometimes the moving part is in the bass clef. The alternating note approach sounds like an underwater yodel, and does not approach the illusion of simultaneous note playing. Only the machine language approach could produce something which sounds similar to what a musician would play.

"A Mozart Composer" uses the second of these approaches to bring the Musikalisches Wurfelspiel to the Color Computer, however. The instructions describe the results by saying "This gives the music an arcade-like 'outer space' sound." Many listeners find it difficult to listen to it for any great length of time. My wife described it by saying, "It sounds as if they are going phtt." Even so, some of the charm of the underlying music comes through. If you want to find out if you like music played in this way, run the following short program:

10 FOR T=1 TO 20:PLAY"L25501A02A03A04A05 A":NEXT

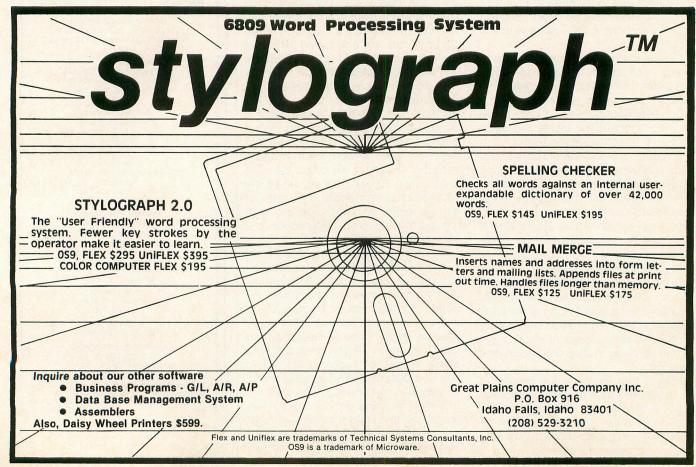
The idea of adapting Musikalisches Wurfelspiel to the Color Computer is an attractive idea, but I would be happier if a true simultaneous playing of the notes of a chord had been used. Knowing how the music sounds, the user must decide for himself if he will enjoy it.

— by David R. Barr

TRS-80 Color Computer Assembly Language Programming

by William Barden Jr. Radio Shack One Tandy Center Fort Worth, TX 76102 Radio Shack #62-2077 \$6.95

THERE ARE SEVERAL excellent books available on assembly language programming for the 6809. There are also several good assembler programs available for use with the Color Computer. Until now, linking the study of one with the use of the other has been left to the programmer, a major obstacle for beginners. After much anticipation and many delays, Radio Shack has finally published their book on assembly language programming for the Color Computer, using EDTASM+. The book, written by programming guru William Barden Jr., is



an excellent tutorial for the beginning assembly language programmer.

The first chapters start with explanations of some of the EDTASM+ commands and how they function in developing a program. Also included in this section are additional comments on some assembly language mnemonics, as well as "Hints and Kinks" on relating the

The book covers hexadecimal and binary number systems (do I hear groans??) in a painless and interesting way. As the aspiring programmer progresses through the book, he is introduced to the 6809 registers, condition codes, branching, indexing and other programming concepts all this while learning to use an assembler with the complete 6809 instruction set, and always in the laid-back, easyflowing William Barden style.

If you have had your Color Computer for awhile and you are thoroughly confused by your more experienced friends when they are talking about "stack pointers," "&HCOOO," or "pseudo ops," this book is a must. At \$6.95, it is also an excellent educational buy.

-Larry Cadman

Glaxxons

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ITH A STENTORIOUS Jaws-inspired soundtrack thrumming in the background, your ship rises up from the bottom of the screen to do battle with the ne'er-do-wells. As they come winging down from the top of the screen to form tightly knit rows of missile flinging villainy, you grip your joystick tightly and fire on the now-descending spacecraft. Then another ship swoops out of formation to dive at you. You veer your ship and keep firing (don't fire too fast or you'll negate your previous shot).

In "Glaxxons," you have four types of enemy ships to clobber plus their missiles. You choose the game speed and playing difficulty. At a speed of seven, the fastest possible, the dum-dum-dumdum of the soundtrack is reduced to a high-pitched nervous giggle (something like the Supremes singing the Jaws theme at 78 RPM). I don't know if the comic relief is intentional, but I got a chuckle out of it.

As you fire away at the ships in formation and the ships peeling off and diving at you, avoid their missiles and the enemy attempts to ram you. You are allowed three hits on your ship before it is destroyed. You are given three ships in a

I found my best offense was, in many cases, a good defense. I would hit as many of their ships as possible while they were in tight formation, and then fire as they swooped down to the kill. Most of the time I spent running. By doing this I stayed alive a lot longer than by being a belligerent Space Patton. It isn't too hard



BY JOHN PAULSON

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- REVIEW\$

avoiding enemy craft, but their missiles are a bit tricky. The only way to knock them out is to hit them dead on.

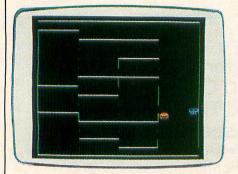
The graphics in the game are acceptable but not spectacular. Sound effects are included but, again, nothing out of the ordinary — your basic muffled phaser blast and disintegration whump. The game provides a running account of your shield power and the highest score for the day is posted on the screen. Instructions on the box are fine and cover everything you need to know.

I played for quite some time trying to find the least frustrating levels of speed and skill, and trying to get the best of the missiles. My best score was a shade over 10,000. You really have to learn to use your joystick, a skill which makes "Glaxxons" a good game for older children and adults.

— Charles Holland

Bumpers

Mark Data Products 24001 Alicia Pkwy, #226 Mission Viejo, CA 92691 (714)768-1551 \$24.95 cassette \$27.95 disk



B UMPERS IS AN interesting maze game featuring invisible walls. As you start the game, either from the top left or bottom right of the screen, and try to make your way to the diagonal corner before your opponent makes it to your corner, you bump into walls. You don't get to see them, however, until you've collided. Once they are visible, they stay visible until the end of the game.

I played the computer each time. My representative was a smiling green face. The computer was dealt a red death's head image. The game is played with joysticks, and you maneuver through the maze until you run into a wall.

Mark Data has incorporated some features that make the game surprising. At the beginning of each game, the randomly generated maze hides three booby-trapped walls. If you or your opponent hit these walls, you are sent back to the beginning. There is another feature that lets you booby-trap a wall using your joystick. Make sure you remember which walls you have rigged; you are allowed three traps.

One other item makes the game especially fun. If you and your opponent cross paths, hit your joystick firing button and you'll send your opponent winging off to some other location in the maze. This is a good ploy if you happen to be near your base and your opponent is coming on strong.

"Bumpers" starts off with a menu-driven introduction that asks for the number of opponents, the dimensions of the maze, set from 1 by 1 blocks to 13 by 15. Then it asks for a skill level from one to four, four being the hardest. This determines how hard the computer will play against you.

Setting the maze at 1,1 creates a wide open space so your only hope is to out-run or zap your opponent. I found the full 13 by 15 maze to be the most fun, and a skill level of two or three to be the least frustrating.

The graphics animation is good, fairly fast and doesn't suffer from refresh blinking or wriggling. The joystick handles very nicely, making maneuverability quite easy.

Using strategy, the game can be enjoyed by adults but children would probably get the most enjoyment from the mazes.

-R.C. Ain

Fury

by Tim Purves Computer Shack 1691 Eason Pontiac, MI 48054 16K/32K **\$27.95 cassette, \$29.95 disk**

FURY IS ANOTHER arcade simulation, but this one is different: this game talks! You don't need any special equipment for sound; just turn up the volume on your TV or monitor. Fury has enough good graphics and sound to move it ahead of the rest. It's one of the best games I've ever seen.

The playing field is in the air. You battle countless numbers of enemy airplanes, helicopters, hot air balloons, parachuters, and, after you reach 5000

points, a magnetic air mine. You earn 100 points for shooting an airplane, 100 for helicopters, 2000 for hot air balloons, and 1000 for ramming a parachuter. It's not possible to destroy the mine. A bonus ship is earned after you successfully shoot down 20 enemy airplanes or helicopters.

One of the best features in this game, and one I believe no one else has for the Color Computer, is the sound. Don't turn your volume up too high or it will sound fuzzy and you won't be able to understand the speech. The game says things like "P..." — no, I won't spoil it for you, you should hear it for yourself. The speech is not the only great feature of this game — it also has outstanding graphics.

I think Tim Purves (the author of this game) and Computer Shack did a great job, and I hope to see more of their work in the future!

—by C. DeSimone

Buzzard Bait

Tom Mix Software 3424 College N.E. Grand Rapids, MI 49505 \$27.95 cassette \$30.95 disk



TOM MIX SOFTWARE'S latest release is one of the biggest feathers in its cap. It has shoe-horned a complete "joust" program into a 32K machine, including sound effects like birds walking and a hand groping in a lava pit.

Buzzard Bait is a game of avian skill. It pits you against computer controlled mounts, a flock of nearly invincible buzzards, and (optionally) one other player. You control your mount by joystick. The object is to dismount your opponents by jousting them when they are at a disadvantage (below you), which turns them into eggs. Eggs hatch into unmounted riders in time, if they haven't fallen into lava. You must run into these eggs to stop this from happening.

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I put jargon in its place, too. If you've ever been intimidated by genius programmers, you'll know what I mean. You'll be able to drop a few accumulators, registers, and zero-indexed offsets into your conversation, too.

So contact me or RB2-3 at Green Mountain Micro. "Micro Language Lab" comes in a notebook containing twelve cassettes, documentation, workbook, and data booklets. It costs \$99, plus \$2.50 shipping and handling. Z80 and 6502 Labs will be available shortly.

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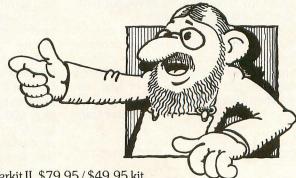
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move. Your bird will walk, run, and even skid to a stop when you change direction. Repeatedly press the button to flap its wings. The wings must keep flapping or your buzzard will fall to the ground, so keeping it flying must become almost second nature before you can make any kind of decent score.

Animation never looked so real. There is no flicker or jerkiness. The birds respond quickly. Sound effects are synchronized with the action, not overdone, and you can tell what is going on by ear. With the proportional joysticks of the Color Computer, the birds are even easier to control than at an arcade — you don't have to bump the underside of things a lot because moving fast horizontally doesn't mean climbing fast, if you don't want to.

As your score gets higher and you make it to more screens, things get tougher. Lava rises up to the ground and burns part of it away. Buzzards show up, first as loners, then as flocks. One must be a master rider to win a joust with a buzzard. Elevated platforms dissolve, turning things into a free-for-all dogfight. I'm not sure what else is thrown at you because my three mounts never got past the sixth flock of opponents.

I found myself concentrating on my flying technique, not cursing the game or computer. It has been a long time since I have played a game good enough to really give me some fun. Tom Mix has hatched a winner.

— J.T., Color Staff

DWP 210 Daisy Wheel Printer

Radio Shack One Tandy Center Forth Worth, TX 76102 (817)390-3885 \$799

OW THAT I HAVE good word processing software and all my correspondence neatly formatted, what can I do about the quality of my printing? About dot matrix fuzzies? Well, one thing is to connect my Color Computer to Radio Shack's letter quality printer, the Daisy Wheel 210.

This printer is software compatible with the DWP 410 printer, and has both

parallel and serial interfaces. It prints in three character pitches (10, 12, and proportional spacing) with up to 115 characters per line at 10 characters per inch. There is also a fairly inexpensive tractor (pin) feed attachment available. And the whole thing is built at least as well as Radio Shack's respected Daisy Wheel II printer.

The 210 automatically underlines selected text with simple one character commands. It also advances or reverses paper by one line feed or by half a line. Paper can be advanced by ½8th of an inch, and the print head can be positioned to ½20th of an inch, too. Superand subscripts are available, as well as automatic bold face, and the plotting of detailed graphs (with extra programming).

The 210 has some intelligent features as well. An internal 180-character buffer makes bi-directional printing possible, which can increase printing speed (an admittedly slow rate of 18 characters per second) by up to 50 percent, depending on text. Radio Shack provides for special character font expansion with an "external program mode." In this mode the host computer tells the printer how wide each character is to be spaced, and how hard to strike it for uniform character density.

The default switch settings are easily changed, since they are conveniently located at the top rear of the case. These switches select the serial or parallel interface, 600 or 1200 baud serial interface speed, paper-empty switch recognition, print hammer intensity, self-test operation, and auto logic seeking mode. The labels for these switches are on the underside of the small lid, so you don't have to chase the instructions down when they need altering. And the printer is easy to connect to the Color Computer via the serial DI cable; I had it running listings 10 minutes after it was out of the carton.

It is a joy changing the print wheel — just pull a lever up and remove the old wheel, drop in the new wheel and push the level back. The ribbon and platen easily pop in or out as needed, too. However, getting the font of your choice is a matter of luck and waiting. Printing speed is too slow for heavy output jobs, too.

The clear plastic lid has a character graduation scale that is not close enough to the paper to be of any real benefit. However, the lid is double hinged — a small lid in a big one — so that single sheet feed by hand is made easier.

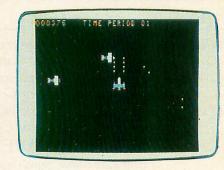
When I tried to use a parallel to serial converter from my Color Computer to the DWP 210, all I could get was garbage. It seems that Radio Shack has altered their parallel interface specifications from that used in the Daisy Wheel II and others, and the converter would need rewiring to be compatible. It really doesn't matter much though — 1200 baud serial operation is more than enough to keep up with 18 CPS.

Altogether, I am quite pleased with my new printer. I get professional results without hassle, and I can still pursue my hobby, hacking graphic plotting programs into shape.

— J.T., Color Staff

Time Patrol

Computerware Box 668 Encinitas, CA 92024 (619)436-3512 **\$26.95 cassette, \$29.95 disk**



A CCORDING TO THE SHEET in the package, the year is 2283 and your spaceship has just meandered through a time warp while flying a recon mission over Moscow after World War IV. Instead of encountering F-47s, you run into Sopwith Camels. If you can work through that group, you get to fight UFOs and helicopters.

What you find when the game starts — after some snazzy graphics — is a ship rooted in the center of the screen, spinning and firing at randomly approaching enemy ships and parachutists. Actually, you can't shoot the parachutists, just ram them. So much for fair play.

The game is controlled by the right joystick and firing button. You are allowed unlimited firing power so you can keep your finger on the trigger as the enemy approaches. I found that a mild sweep with the trigger down cleared the baddies most effectively.

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Sherlock Holmes/Agatha Christie fans-It's finally here—A murder mystery game for the 80-C! Mr. Goodbody has been killed in his mansion and you must solve the mystery. WHO committed the murder, WHERE did it occur and HOW was it done! Question suspects, find the secret passage, and break the code to get clues. Hi-Res graphics enhances this excellent game. The computer records the clues you obtain on a clue inventory screen and also provides suspect descriptions at the touch of a finger. A fast, fun game that will sharpen your deductive skills. Every game is

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- REVIEW\$

into the fray cold, a practice mode is included. Play it for a spell; you'll need to get used to the joystick control. You'll also have to get used to the way action slows down if you hold the firing button down.

I found that the ship really didn't want to point in certain directions easily. Whether this was due to my joysticks or the routine in the program controlling joystick movement, I don't know. It wasn't a real problem, and over all, the program behaves quite well. Movement is acceptable, graphics are average and the only drawback is the display for the enemy ships' bombs. They look too much like stars: quite often I didn't even bother with them and succumbed to their power as a result.

As you get through the enemy, you are rewarded with a chance to shoot a big enemy ship. Hit it twice and you get an extra ship, plus a boost to the next level of play.

The instructions are good, with all you need clearly described. Time Patrol is a good game, especially for children.

— Charley Marshall

of it are displayed. The narrator then uses the word in context and asks a question. Questions use multiple choice or fill-in-the-blank formats. The student must answer multiple choice questions by depressing number keys 1, 2, or 3; the fill-in questions require typing the correct answer. A correct response must be entered before the program continues.

Talk/tutor programs are an excellent format for instructional software. They provide auditory learners with the reinforcement they need to learn more effectively. Talk/tutor format employs the recorded voice; the advantage over voice synthesis is in speech clarity. Many synthesizers cannot produce the clarity of voice necessary for top quality computergenerated speech.

The documentation supplied with the programs is clear and concise. However, younger children may require the assistance of an adult when initially using them.

I believe these programs are adequate for home instruction. Some of the graphics could have been of a higher quality, but for the minimal cost, I feel these programs will be beneficial.

— by David Macali

HJL Keyboard

HJL Products Inc. 955 Buffalo Road P.O. Box 24954 Rochester, NY 14624 (716)235-8358 \$79.95



THINGS ARE DIFFICULT enough when I am working against deadlines, but when my original Color Computer keyboard required WD-40 and TV tuner cleaner to stay functional, I decided to act. I ordered a brand new replacement keyboard from HJL Products, which claims their product was designed specifically for the Color Computer.

It is well-designed. Built on a sturdy aluminum plate with stiffening folds, the keyboard comes with complete, simple, well-written installation instructions, and has a better feel than any other Color Computer keyboard I have tried — similar to the Model III/4 keyboard, but with a slightly heavier action.

The ergonomic (efficiency-minded) keytops, with anti-glare surfaces and highly readable characters, are welcome. The keytops have a color layout almost identical to the original keyboard (the shift keys are gray instead of white), and are just where this long-time Color Computer user has learned to expect them.

Installing the keyboard took only 15 minutes. The hardest part was the removal of the top of an unused support post. For that I used a pair of diagonal cutters. There is a new bezel for the case, and clips to hold it and the keyboard in place.

Two problems with the instructions arise due to the many internally different versions of the Color Computer that Radio Shack has created. My 32K revision E board had a sheet plastic and foil extension of the ground plane under the keyboard that the instructions don't mention. It was in the way and had to be removed with scissors. The new keyboard is properly shielded, which makes the foil unnecessary, anyway. The instructions remind you that there are two kinds of keyboard connectors, and that all TDP-100s have the newer kind. However, I have seen an older TDP-100 with the older type. Fortunately, few owners will be confused by these oversights.

Keyboard feedback is moderate to light, and response is quick. It feels lighter than it is because keystrokes are recognized after only a third of the full key travel. This required some retraining of my touch typing, as I had gotten used to the heavy clicking of the stock keys. I have been told I am a fast typist, but when a friend sat at my newly modified system he made me look like a keyboard klutz. This keyboard lives up to its claim of speed.

Four new function keys are a mixed bag. How could I use them without new keyboard software to define them as function keys? The routines in Color Basic ROM don't expect keys to be present in the matrix where these function keys have been added. Clearly some keyboard driver extension is needed, and HJL now includes one free with each unit. The routine is in Basic and takes about 20 minutes to enter. This driver

Words About Things Words That Act

Radio Shack One Tandy Center Fort Worth, TX 76102 4K

\$8.95 cassette, each

Two software programs offered by Radio Shack were developed to meet the needs of children in the rapidly expanding area of home instruction. Reinforcing skills taught in the classroom is an important factor in the total educational process. These vocabulary tutors help develop and reinforce the child's vocabulary.

"Words About Things" and "Words That Act" use a talk/tutor format. This format uses the recorded voice. After the programs are loaded they function by user response; the play button on the cassette recorder remains depressed, and the program starts and stops automatically.

As each new vocabulary word is introduced to the user, the word and a picture

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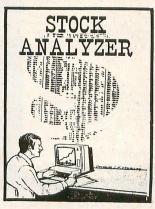
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program is in a multiple choice questionnaire format where the user is red as to a response to a specified management situation. Tutorials help the learn new management skills and insights. The programs include voice tailon irom the author, Mr. Terry Barker. "BEING BOSS" is based in part on withcoming management books" BOSS Talk. and "THEORY C."

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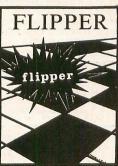
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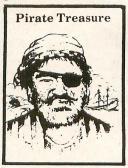
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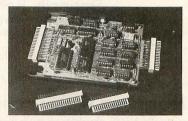


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turns the F1 key into a text screen print key; F2 becomes a repeat key; F3 duplicates the Shift 0 case toggle function; and F4 becomes a control key. The screen print function key works when you hold it down and press Enter, and since both of those strokes are passed to Basic, a ?SN ERROR message pops up at the end of the print.

All in all, the keyboard is a sturdy and reliable unit. Contacts are the new fulltravel membrane type, spillproof and rated for 100 million cycles. With a 15day money back guarantee and full one year warranty, this keyboard is well worth the price.

— J.T., Color Staff

Math Invasion

Crystal Software 6591 Dawsey Road Rock Creek, OH 44084 \$19.95, cassette only

OU DON'T HAVE to be a large company to produce a successful program. Crystal Software already has Time Teacher, a fine time-telling program, on the market. Now comes Math Invasion, a fun math game. Despite the arguments against this "fun" type of educational programming, I found myself intrigued and playing for quite a while. Perhaps it is the old Atari Space Invaders love coming out in me. I also tested the program on an eleven-year-old who shows no particular interest in computers and found that the program was again used for a long time.

Math Invasion is a take-off of Atari's Space Invaders. Four aliens containing math problems descend to your planet. Your mission is to solve the problems and destroy the aliens. This is vicarious violence, but isn't that what makes space games so popular? I share the concerns of many who do not like violent games, but Math Invasion doesn't carry the concept of destruction too far — nor is destruction its main theme.

There are two menu options for the program. The first lets you select addition, subtraction, division, or multiplication. The second asks if you are a beginning, intermediate, or advanced mathematician. Be careful, advanced problems are hard to compute in your head while those aliens are descending.

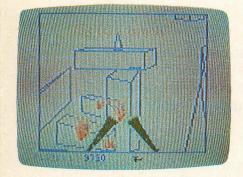
Addition and subtraction skill levels can call for either one digit or double digits. Multiplication can range from 0 to 9 for the first number and 7 to 9 for the second number. Division has the same range as multiplication.

A fine feature of this program is the "computer aided defense system" (CADS), which provides a correct answer to one of the descending problems. The program also includes an auto-display mode in which the computer plays itself.

— Dr. Paul Kimmelman

Firecopter

by Dale A. Lear Adventure International P.O. Box 3435 Longwood, FL 32750 16K Extended Basic, Joystick \$24.95 cassette



HAVE ALWAYS WANTED to play a real 3-D game simulation in real time. With Dale Lear's newest release I can. And, it's one with a humane mission instead of mindless destruction as a goal. It seems that a local ex-con, Pyro Maniac, has assembled an army of torch-happy androids dedicated to the cremation of the city...

Í have been assigned a laser-armed water cannon helicopter. The altitude control seems to be locked into rooftop height, and the heat resistant windshield develops high distortion around the edges of my field of view, not to mention making the buildings appear in simple outline form. The blades chop ominously overhead, while the city starts to burn before me. I rush to battle, joystick sluggish in my grip, to the nearest flames.

I almost have the flames completely out when a sniper appears. He turns out to be hard to hit, and before I can dispatch him my previous work is going up in smoke again. Precious seconds tick away as I douse it again, then proceed to sweep back and forth over the city. A bigger fire appears, and with it the warning FIRE LEVEL CRITICAL. As I struggle to keep this one under control I notice another building nearly out of view begin to disintegrate. Turning my hoses on it, I realize that I am too late to make a difference. The skeleton collapses, and then the "end of city" alarm sounds.

I like the concept of the game. It plays fairly realistically, but the response is too slow to be smooth and allow accuracy. I also missed the ability to climb higher to get a better look at the city as a whole; but then again, I am a perfectionist. The ability to turn the 'copter around would be nice, too; but I know how much the 6809E microprocessor must have been stretched to its limits already.

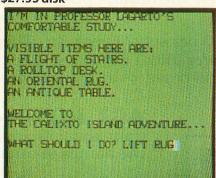
The game is very playable, and most important, fun. I have spent quite a few hours in the "hot seat" and haven't ever regretted the time spent. Now, if only one of the full-size arcade manufacturers could start trends in realistic and humane arcade games...

— J.T., Color staff

Calixto Island

Mark Data Products 24001 Alicia Pkwy, #226 Mission Viejo, CA 92691 (714) 768-1551

\$24.95 cassette \$27.95 disk



CALIXTO ISLAND IS AN adventure game that involves high-tech chicanery, grizzled beachcombers, marshes and hills, spooky houses with strange rooms — basically the combination of about 10 kinds of action films. Sort of a "Raiders of the Lost Ark" in machine language. You get to jump around collecting, using and dropping treasures in the quest for the rightful spot in which to return some mysterious treasure.

For beginners in adventure games — don't lose heart. It is too easy to quit in Professor Lagarto's study feeling like you can't get anywhere. Here is a hint — sometimes it helps to examine things more than once. It also pays to fiddle with items more than once. You will be tempted to use the HELP command, and by all means try it. The command, indeed, does need help. It was so vague it became virtually useless — except for triggering some interesting situations. "Calixto Island" is the first adventure game I've seen in which the HELP command did something rather than just flashing the mandatory oblique message.

Another word for adventure players — make a detailed map, and catalog your moves, too. Old hands know this, but beginners will soon discover the necessity of this intricate job.

Watch out for the flashlight — the batteries are in bad shape. Make sure you know where everything is because you'll need to backtrack constantly to pick up items for later use.

I found the written instructions on the box and the screen instructions adequate but lacking in detail and needing more explanation about the story background, and, for beginners, a word about adventure games in general.

"Calixto Island" would have been less frustrating if a vocabulary had been included. It also seemed to do a bit of random jumping at times. For instance, trying to get out of the cellar and back to the study was perplexing. Sometimes one method worked and another time the game didn't understand my request.

A Save feature lets you save the game in progress and pick up on it later. It saves the game to tape or disk.

I liked "Calixto Island." As soon as I solved one puzzle, another situation presented itself. Do be careful in the dark, though: I must have cracked my head and died two dozen times. Now, I'm back at the pyramid and here's the crevice...

— Charles Holland

(Ed.'s note: Mark Data tell us the new "Calixto Island" has hi-res graphics!)

Have you heard about our new

EDUCATIONAL SOFTWARE LICENSE PLAN

for public and private schools?



Max Jerman

The complete set of quality instructional software that was formerly available only at retail prices is now available to schools at less than **5%** of its current retail price.

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Over 250 disks containing more than 1200 lessons for grades K-9 in reading, spelling, language arts, math, problem solving, math games, reading games, and programs for young learners are included in the plan.

THE PLAN—Schools join together to form a cost-saving consortium of 50 or more members. One school or eductional agency acts as Host. The Host will receive a master set of program disks and manuals. The consortium will be licensed to make as many copies of the masters as member schools need for their various computers.

THE BENEFITS—Consortium schools will automatically receive updates and new program releases at no increase in membership fee. There will be no shortage of quality software for the most popular computers.

THE COST—Only \$250 per school per year. There is an additional start-up cost of \$250 per school to cover initial expenses. Licenses for specific computers are available to large consortia or states at reduced cost.

BERTAMAX INC. Max Jerman, Ph.D., President



ACT NOW—Form your own consortium and contact us. Contact us directly for the names of interested schools in your area.

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NEW:PRODUCT\$ --

The Personal Touch

Associated Technology Box 448 Estille Springs, TN 37330 (615)967-9159

Personal Message, a program that adds a novel touch to birthdays, anniversaries, promotions, and other special occasions, is now available from Associated Technology. It prints your message in characters seven inches high onto a standard fan-fold paper. From a menu of options users can select a variety of special occasion wishes. The wishes can be mixed with your own witty, or sentimental, message. The program costs \$19.95.

Software Licensing

Bertamax, Inc. 3647 Stone Way North Seattle, WA 98103 (206)547-4056

Bertamax Inc. has an Educational Software Licensing Plan designed to solve the software acquisition problems facing schools that have more than one brand of microcomputer in their buildings and cannot afford to purchase separate program versions for each machine. Schools using a single computer can realize cost savings through membership, too. Schools must form user consortiums of 50 or more members, with one named as Consortium Host. Hosts will receive a master set of some 250 program disks and accompanying teachers' manuals. The host will be licensed to reproduce an unlimited number of copies of the program disks and manuals for use by member schools. The programs included in the plan will run on Apple, Atari, Commodore 64, IBM-PC, TRS-80 Color, and TRS-80 Model III microcomputers. The plan covers nearly all the instructional programs Bertamax has produced. Programs designed for teachers, counselors and administrators are not included.

The annual membership fee

per school will be \$250, but this year's start-up license fee is \$500 to cover initial costs. Member schools will automatically receive updates and new releases as they become available. Schools wishing to participate in the plan should contact Bertamax Inc. for names of interested schools near them. Consortiums are being licensed on a first-come basis.

Mailing List

JCL Data Processing Services Box 283 Spotswood, NJ 08884

JCL first wrote a mailing list program for its own use, then decided to sell it to the public. For \$49 you can list up to 1,224 names and addresses, print labels either of the whole list or of entries in a specific zip code or town, create back-up tapes and restore corrupted disk files from tape, sort files by any field desired, modify addresses, and more. The program price includes a cassette copy of the Basic source code program and a manual. The program requires a 32K machine, a disk drive, and Radio Shack's disk operating system.

FICA-83

Parsons Software 118 Woodshire Drive Parkersburg, WV 26101

FICA-83 is designed to calculate the approximate monthly pension check under the 1983 changes to the Social Security Act of persons born between 1915 and 1946. The program is an aid to retirement planning. It calculates Social Security pensions under a variety of options. The program may be used to send data either to the screen or to an 80-column printer. A 16K machine with Extended Color Basic and a tape recorder is required. FICA-83 comes with written instructions. The cassette costs \$19.95.

Supercord

Cord, Ltd. 1548 Brookhollow Drive Santa Ana, CA 92705 (714)545-1643

New possibilities for computers and word processors are open with Cord Ltd.'s Supercord, a computer-typewriter interface. The Supercord links nine brands of electronic typewriters with over twenty brands of computers, including the Color Computer. Cord Ltd. was recently awarded a U.S. design

patent for Supercord.
A partial list of electronic typewriters able to use Supercord includes Adler, Brother, Royal, Smith-Corona, and Silver-Reed machines.
Supercord is offered in a variety of combinations to enable its attachment to specific computers and typewriter models. There is even a Supercord II that has a 4K memory which lets computers receive data while typewriters type previously entered data.

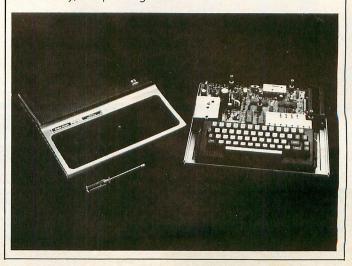


KB-500 Keyboard

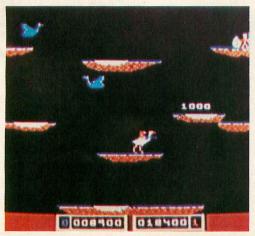
Key Tronic Box 14687, Dept. E2 Spokane, WA 99214 (800)262-6006

The KB-500 keyboard is designed to improve the efficiency and capabilities of the Color Computer. It features a 15 — 20 percent higher data input rate, a user programmable function key, complete legend

description, non-stick keys, high spring force on Clear and Break keys to prevent entry errors, full sculptured keytop array with low profile keytops, and locating "pips" on home row keys. The keyboard carries a suggested retail price of \$89.95, which includes the optional plug adapter for revision and newer models of the computer.



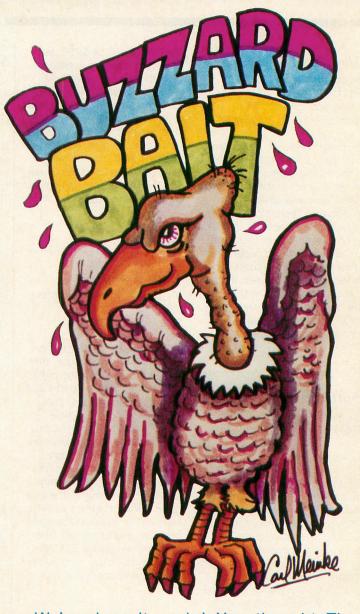






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NEW:PRODUCT\$ --

O-Pak

Frank Hogg Labs 770 James Street Syracuse, NY 13203 (315)474-7856

FHL has taken its high resolution screen package from Flex, added a number of utilities, and is marketing it as "O-Pak." For the Radio Shack OS-9 operating system, O-Pak's predominant utility is the high resolution screen, with the same control codes and features found on Flex, including screen formats of 64 x 32, 64 x 24, 51 x 24 and 32 x 16. O-Pak comes with utilities that allow the copying of files between Flex, Radio Shack's OS-9 and standard Radio Shack DOS disk formats. Other commands allow cataloging disks and listing files of different disk formats. O-Pak will be sold for \$34.95.

Lizpack, Showpack

Crimson Software (The Research Associates Group) 32 Beverly Heights Tuscaloosa, AL 35404

Lizpack is a statistical analysis system that (Crimson touts) will demonstrate "beyond doubt" the capability of the Color Computer to compete with any other personal computer on the market. Aimed at both novices and experienced researchers, Lizpack contains 85 programs on seven disks and requires almost 800,000 eightbit bytes for storage. Its core package includes categories on data files administration, ASCII formatted files conversion, descriptive statistics, comparisons of means, regression analysis, and more. There are packages on factor analysis, discriminant analysis and canonical correlation, cross tabulation, time series analysis and forecasting, too. The last package is Showpack, a disk graphics package for editing and labeling Lizpack graphs that

have been saved to disk. Lizpack requires 32K of memory, Extended Color Basic, a disk drive and a printer. The product in its entirety costs \$480. Individual packages range from \$50 to \$200.

The Computer Dictionary

Running Press 125 South 22nd Street Philadelphia, PA 19103 (215)567-5080

Electronic terms, manufacturers' phrases, keypunchers' slang, and hackers' babble getting you down? Can't tell a disk from a database, a bubble sort from a breakpoint? Save downtime with *The Computer Dictionary*, released in January with up-to-the minute entries alphabetically listed and complete with reader-friendly definitions. The 128-page trade paperback retails for \$4.95.

How To Buy Software

St. Martin's Press 175 Fifth Avenue New York, NY 10010

With chapter subtitles like "Everything Your Manuals Never Tell You," and "How To Get Thousands of (free) Programs over the Phone," and with a glossary entitled "The Computerese and Jargon Interpreter," author Alfred Glossbrenner has again taken aim at those users and would-be users who are still shaky on computing fundamentals. How To Buy Software is written for computer owners baffled by the plethora of software available to them. Right now it's being aimed at those booksellers who are considering selling software. The book is over 500 pages long and costs \$14.95.

Display Noise Eliminator

Emerald Systems 13052 Ferntrails Lane Creve Coeur, MO 63141

The Display Noise Eliminator will remove the annoying jitter and wavy lines that your Color Computer is putting on your television display. Interfering signals come from the computer, disk controller, and disk drives. The Display Noise Eliminator is a special type of filter which traps this noise and prevents it from reaching television sets used as a display monitor. The Eliminator is supplied as a kit which takes two minutes to install. Neither special tools nor soldering is required. The cost is \$14.

record. Eight report formats can be custom designed. A summary report feature will summarize a database based on any field of information. Six label formats can be set up; each is given a title when it is designed and becomes a custom menu for later selection. Label and report formats can also be password protected. Record indexing allows an alphabetical order to be obtained for a database based on any field. Second and third order fields can also be selected. Records can be accessed by using the main sort field as a search field. A 1,000 record database can have any record located in 15 seconds or less. Over 60 pages of documentation cover the program. The cost is \$79.95.

Enhanced Pro-Color-File

Derringer Software Box 5300 Florence, SC 29502 (803)665-5676

Pro-Color-File Enhanced is a program for creating programs. Users can define up to 60 data fields within each record. Up to 1020 bytes can be allocated for use by each and the fields can be spread over four disk drives to optimize storage capacity. Up to four data entry screens are available. Each is user defined and can be password protected. Data entry features full cursor control text editing with single keystroke field duplication from previous input or duplication of an entire record. Screens can be switched while entering data and a hardcopy can be generated from the screen display. Equations can be used to have calculations performed on all or selected records of the entire database automatically — handy for adding interest and late or monthly charges. Equations can also change new figures calculated without having to update each

MagiGraph

The Micro Works Box 1110 Delmar, CA 92014 (619)942-2400

A graphic development utility for the Color Computer, MagiGraph is for experienced Basic and assembly language programmers. It simplifies the task of drawing highly detailed graphic characters, up to and including an entire high-resolution graphic screen. Magi-Graph has a full set of logical operation and pixel manipulation functions that simplify the development of a character in all its different possible color and position combinations. The program offers nine animation buffers so various positions of an animated character can be tested and revised. Pixel codes of a graphic character can be listed in hexidecimal numbers to a printer, and the graphic screen can be saved on tape or floppy disk. MagiGraph is available on cassette for \$34.95 (16K required), disk for \$39.95 (32K Extended Color Basic required), and Amdisk cartridge for \$44.95.

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QUASAR ANIMATIONS

1520 Pacific Beach Drive San Diego, California 92109

New Color Computers

Radio Shack One Tandy Center 1800 One Tandy Center Fort Worth, TX 76102 (817)390-3300

A pair of new 16K machines, the TRS-80 Standard Color Computer 2 and the TRS-80 Extended Color Computer 2, are being sold. The Standard lists for \$239.95, the Extended for \$319.95. The Standard comes with the Color Basic language, including data and string handling, dimensioned arrays, math functions, and nine-digit numeric accuracy. A 308-page user's manual offers instruction on writing programs with color, displays, and sound. The Extended version includes all that plus more advanced programming capabilities one example is the creation of high-resolution color graphics using one-line commands. The Extended version also includes PEEK, POKE, and USR commands, multi-character variable names, string arrays up to 255 characters, and full-featured editing and tracing. Each are, of course, compatible with the current Radio Shack software line.

and object in the computerized workplace static-proof. For a copy of the brochure, write ACI

Tax Command

Practical Programs, Inc. Box 93104 Milwaukee, WI 53202

Tax Command, a Federal income tax calculation program, is in its second year of publication with all known bugs expunged. It provides a line by line method of calculating income tax, averaging income, itemizing deductions, capital gains and losses, and contains tax tables for every filing status. On computers with over 48K, Tax Command includes numerous other schedules as well. Tax Command contains built-in tables to calculate your tax refund or payment, and tells when to income average. The program does not print on your tax form, but prints/lists each entry needed. Tax Command's suggested price is \$24.95.

Static Control

ACL Inc. 1960 E. Devon Ave. Elk Grove Village, IL 60007 (312)981-9212

"What Every Computer User Should Know About Static" is the title of a new brochure from ACL Inc. The eight-page folder contains information on electrostatic charges in computer environments and describes treatments that can eliminate glitches and downtime caused by uncontrolled static charge. The brochure explains the nature and cause of static charge build-up on people, equipment, and materials employed in computer environments, and outlines how ACL's Staticide liquid can make virtually every surface

Cash Management

Radio Shack One Tandy Center Fort Worth, TX 76102 (817)390-3885

By entering income and expense amounts on a regular basis, Cash Budget Management tracks where money is spent for up to a year. The program includes 10 income categories, 86 expense categories and three cash accounts. Users may also define budget categories to fit individual needs. Information can be printed or saved on disk. Cash Budget Management is offered for \$49.95. A 16K (or greater) Color Computer with Extended Color Basic, a disk interface, disk drive, and blank disks are needed.

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he computer has changed the way information and information processing occurs in the world, and thus the way we think about the world and our lives. Governments of impoverished nations can be as affected by the computer age as the

societies of industrialized nations, but the story does not end there.

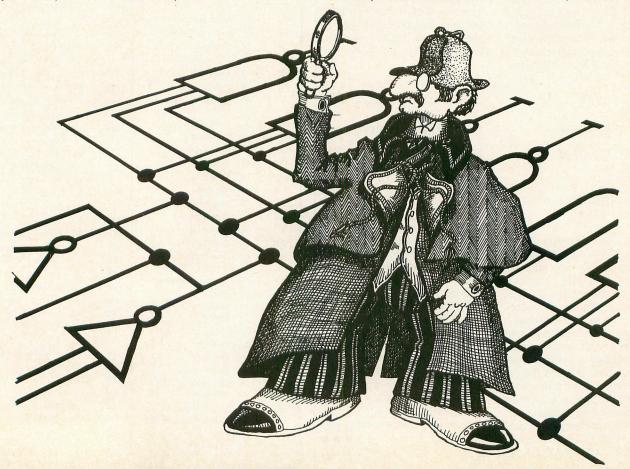
The major difference between the flow of information in free and authoritarian societies is the freedom to own and fully use that electronic gadget tucked neatly on the shelves of homes, offices, and classrooms. Not only do we in the free world have easier access to computers; once we get them, our horizons are almost unlimited. We have what the characters in George Orwell's 1984 nightmare don't — a personal computer. The prophesy made in Orwell's book came true, but is weaker in some places than in others. Its horrors seem to hold true only when the authorities control most of the computers, and all the rules those computer users must live by. That inexpensive little Color Computer you're so fond of is as much your wreath of garlic on the door keeping Big Brother at bay as it is (to some) an ill-perceived symbol of a world fast growing impersonal, hard to understand, and just plain scary.

I don't mean to imply that all is well, and will continue so in the free world, now that Tandy and others have made computers as available as toasters. Nor do I mean that the key to world peace is the home computer. Computers (of the other than home variety) influence many facets of daily life. Think of all the computer connections you are subjected to every day: phone, electric, gas and other utility usage and billing are tracked, assisted and compiled by computer. Many of us shop at bar code scanned checkout counters. The cars we drive were designed for economic thrift and safety by computers. Many radio stations switch from song to commercial to network news and back by computer. This list is only a superficial sampling of how we interact with or are otherwise affected by computerized processes every day. Much of what's listed is not generally considered a positive contribution to society. (I hate computerized radio stations.)

Now imagine the other situation. People in the Soviet Union are just as affected by computer connections, yet their ability to understand the process is limited because access to technological information is a politically granted right permitted to only a select few.

Years ago, before Tandy and Apple made microcomputers available to the free public, our understanding of computers was small. When your phone bill was incremented by a mistakenly large number of zeroes occurring to the left of the decimal point, your reaction was probably outrage. Now you're more likely to be understanding of how the mistake occurred; followed by outrage because you know you and your Color Computer wouldn't make such a mistake.

A computerist will read about a fellow computerist break-



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ing into the Los Alamos computer system, or that of some mega-corporation somewhere with a feeling of smug satisfaction. But all alarms ring when we realize that information about us can be as easily obtained by anyone with patience and a knowledge (often limited knowledge) of mainframe protocol, or persons with "official access" to gathered information.

The danger inherent in the willfull gathering and dissemination of any and all information will not go away because you, and many others, own Color Computers and other micros. The misuse of information will become a greater danger as computers become more widespread.

That is today's challenge. We must look at our new technological responsibilities in an intelligent manner and not like children left unattended in a candy store. The breaking into a top secret computer system is no laughing matter. But what is more irresponsible: the act of trying to gain access to Los Alamos because of the challenge involved, or the fact that high-level defense secrets are stored in a system that can

be violated by a teenager with idle time?

Government legislation is already gathering behind regulation of the ownership and distribution of electronic information. For instance, the U.S. Appeals Court recently overturned a previous Federal Court ruling that said, in effect, that a computer program burned onto a silicon chip or magnetic disk is not readable by a human and is therefore not protected by copyright rules and regulations. The case was Apple vs Franklin Computers. Franklin manufactures a workalike version of the Apple II. The company admits that it copied the architecture of the Apple, but argues that the Apple II's ROM (the real subject of controversy) is not information that can be owned; after all, a ROM is no more than a circuit which uses electric impulses to turn switches on and

The Pennsylvania court that handed down the original ruling was irresponsible or confused. The judgement was conceived in ignorance of the technology it was affecting. When copyright laws were first established, computers were not even a fanciful subject for the imaginations of fiction writers. When the laws were revised in 1976, computers were mysterious science machines we occasionally read about in an ar-

ticle on the space program.

The ink was barely dry on the revised laws when Tandy produced the TRS-80 microcomputer. That micro had a 4K RAM keyboard with a nifty but limited version of Basic which was written by a relatively unknown company called Microsoft. This all happened less than a decade ago, in fact, all within the past six or seven years. No one, not even Tandy, thought microcomputers would sell so well. So it's not surprising how we all, including the government, fell so far behind so quickly. But everyone, especially the government, needs to get up to speed quickly. A good programmer works hard on his creation. He deserves the same protection as the writer of fiction. The Appeals Court corrected a bad ruling. But it will happen again, hopefully less frequently, until eventually society will be better informed so that it will be able to judge its technological sector more responsibly.

How we take on the responsibility of understanding and directing our technology and the acts and works it makes possible relates directly to how much we become regulated.

When considering my earlier question about who was more irresponsible — the Los Alamos computer experts or the teenager who broke into their system, I have to answer that the Los Alamos people were more at fault. It is their responsibility to effectively control access to their private information, just as it's my responsibility to safeguard my private word processing files. Who is more wrong in the Apple vs Franklin case? The court that made the first ruling. Legislators create laws and courts are supposed to interpret them. That is a safeguard against, in part, laws that need readjusting in light of modern realities. If the copyright laws are already becoming irrelevant, it is the court's function and responsibility to fine-tune them. That's why judges write statements explaining the basis of their decisions. But how can a judge fine-tune a law concerning a new part of society he doesn't understand? And how can a technology that is so all-encompassing be readily governed?

Computers have created a new responsibility that everyone must shoulder. The right and ability to access to information demands responsibility toward the dissemination of that information. George Orwell must have thought we wouldn't be able to handle the burden and would allow society's authorities to assume control by default. There's a good chance he will be proven wrong. As long as we, as a society, understand the capabilities and limitations of computers, we maintain the ability to keep them in their places — on a shelf

somewhere in your house, office, or classroom.

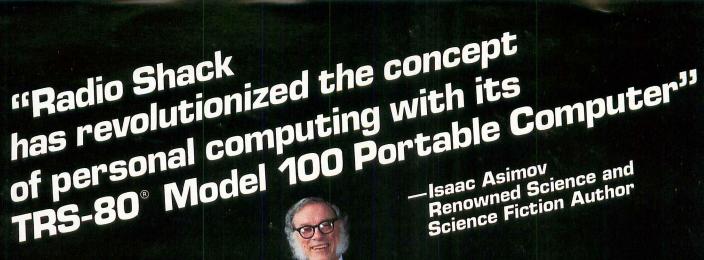
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